BOOK CHAPTER

Head and Neck

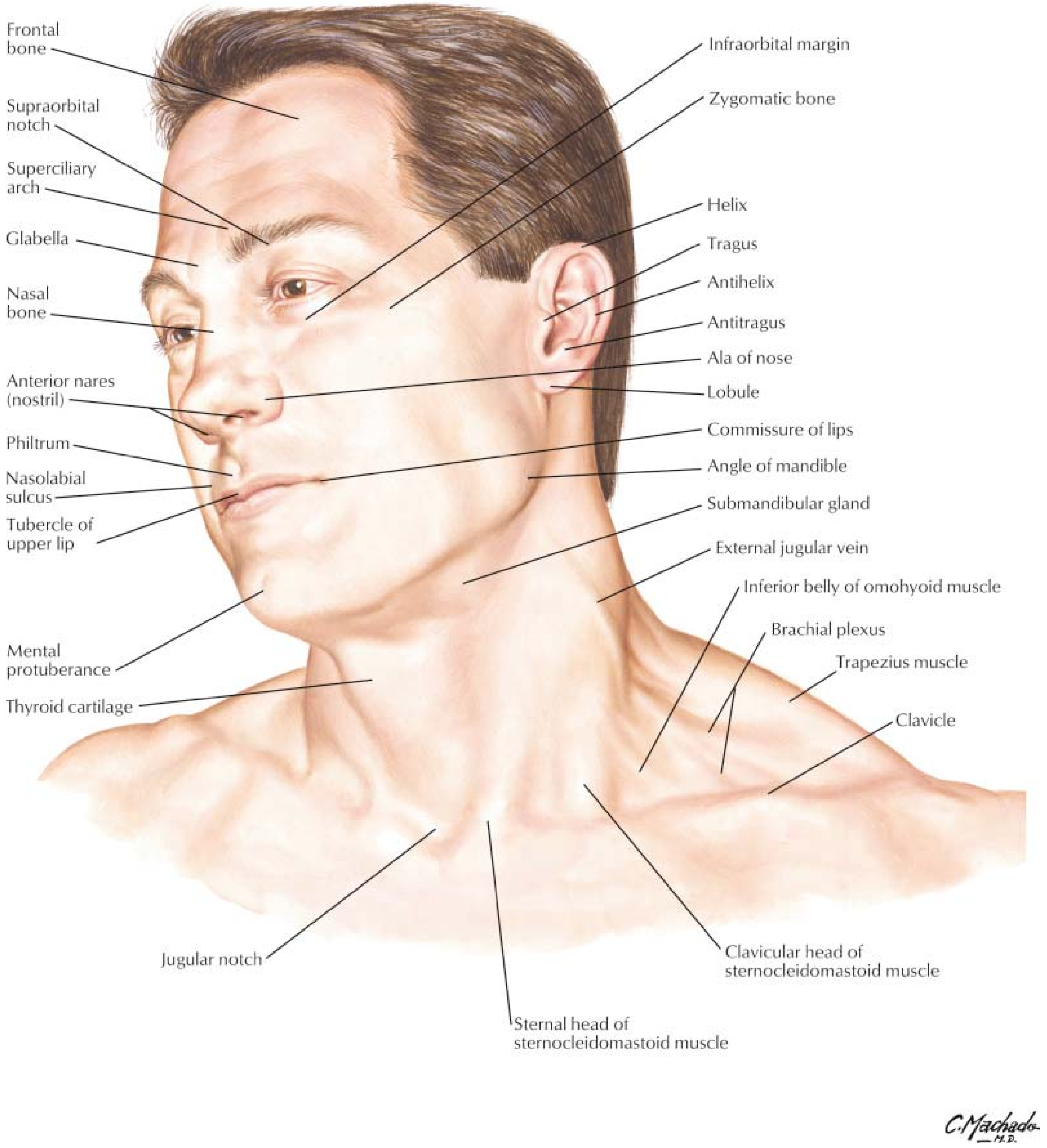
Frank H. Netter MD

Atlas of Human Anatomy, 2, 11-174.e16

Surface Anatomy

Plate 8 Head and Neck: Surface Anatomy

See also **Plate 171**


Frontal bone
Supraorbital notch
Superciliary arch
Glabella
Nasal bone
Anterior nares (nostril)
Philtrum
Nasolabial sulcus
Tubercle of upper lip
Mental protuberance
Thyroid cartilage
Jugular notch
Infraorbital margin
Zygomatic bone
Helix
Tragus
Antihelix
Antitragus
Ala of nose
Lobule
Commissure of lips
Angle of mandible
Submandibular gland
External jugular vein
Inferior belly of omohyoid muscle
Brachial plexus
Trapezius muscle
Clavicle
Clavicular head of sternocleidomastoid muscle
Sternal head of sternocleidomastoid muscle
C. Machado M.D.

Superficial Head and Neck

Plate 9 Cutaneous Nerves of Head and Neck

See also **Plates 39** (s0195) , **42** (s0215) , **61** (s0310)

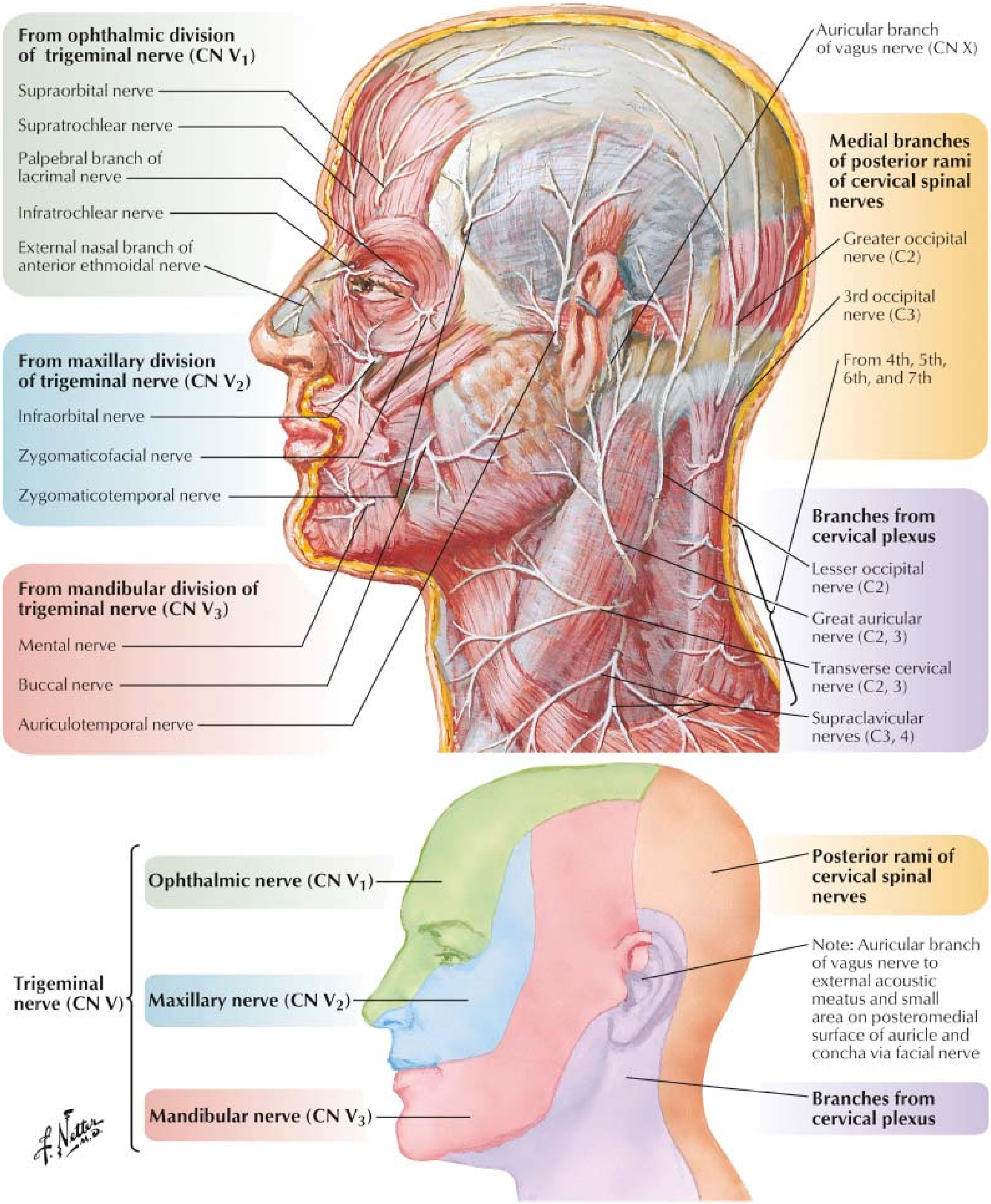

From ophthalmic division of trigeminal nerve (CN V1)
Supraorbital nerve
Supratrochlear nerve
Palpebral branch of lacrimal nerve
Infratrochlear nerve
External nasal branch of anterior ethmoidal nerve
From maxillary division of trigeminal nerve (CN V2)
Infraorbital nerve
Zygomaticofacial nerve
Zygomaticotemporal nerve
From mandibular division of trigeminal nerve (CN V3)
Mental nerve
Buccal nerve
Auriculotemporal nerve
Auricular branch of vagus nerve (CN X)
Medial branches of posterior rami of cervical spinal nerves
Greater occipital nerve (C2)
3rd occipital nerve (C3)
From 4th, 5th, 6th, and 7th
Branches from cervical plexus
Lesser occipital nerve (C2)
Great auricular nerve (C2, 3)
Transverse cervical nerve (C2, 3)
Supraclavicular nerves (C3, 4)
Trigeminal nerve (CN V)
Ophthalmic nerve (CN V1)
Maxillary nerve (CN V2)
Mandibular nerve (CN V3)
Posterior rami of cervical spinal nerves
Note: Auricular branch of vagus nerve to external acoustic meatus and small area on posteromedial surface of auricle and concha via facial nerve
Branches from cervical plexus
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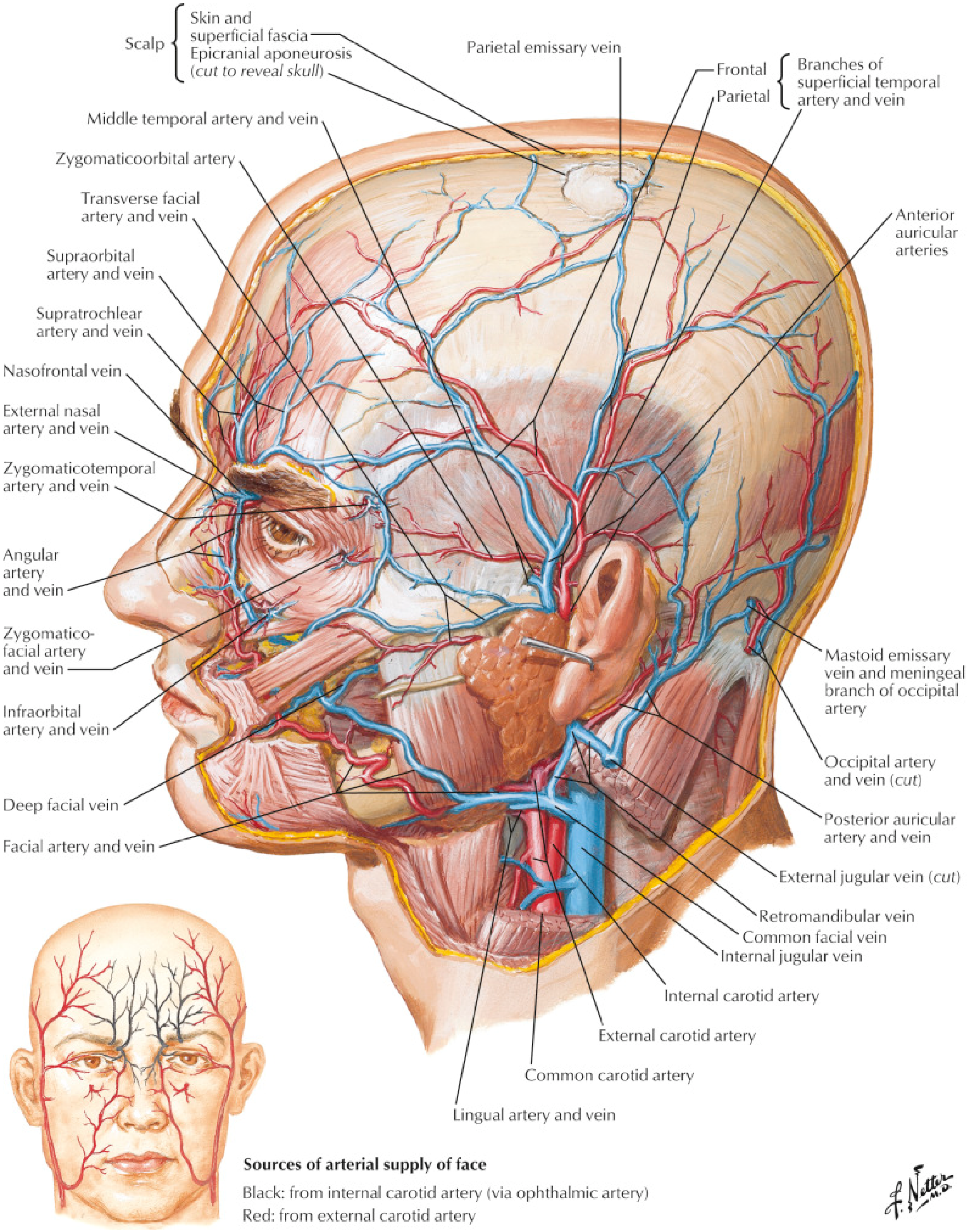
Plate 10 Superficial Arteries and Veins of Face and Scalp

See also **Plates 57** (s0290) , **83** (s0430) , **84** (s0435)


Scalp
Skin and superficial fascia
Epicranial aponeurosis (*cut to reveal skull*)
Middle temporal artery and vein
Zygomaticoorbital artery
Transverse facial artery and vein
Supraorbital artery and vein
Supratrochlear artery and vein
Nasofrontal vein
External nasal artery and vein
Zygomaticotemporal artery and vein
Angular artery and vein
Zygomatico-facial artery and vein
Infraorbital artery and vein
Deep facial vein
Facial artery and vein
Parietal emissary vein
Frontal
Parietal
Branches of superficial temporal artery and vein
Anterior auricular arteries
Mastoid emissary vein and meningeal branch of occipital artery
Occipital artery and vein (*cut*)
Posterior auricular artery and vein
External jugular vein (*cut*)
Retromandibular vein
Common facial vein
Internal jugular vein
Internal carotid artery
External carotid artery
Common carotid artery
Lingual artery and vein

Sources of arterial supply of face

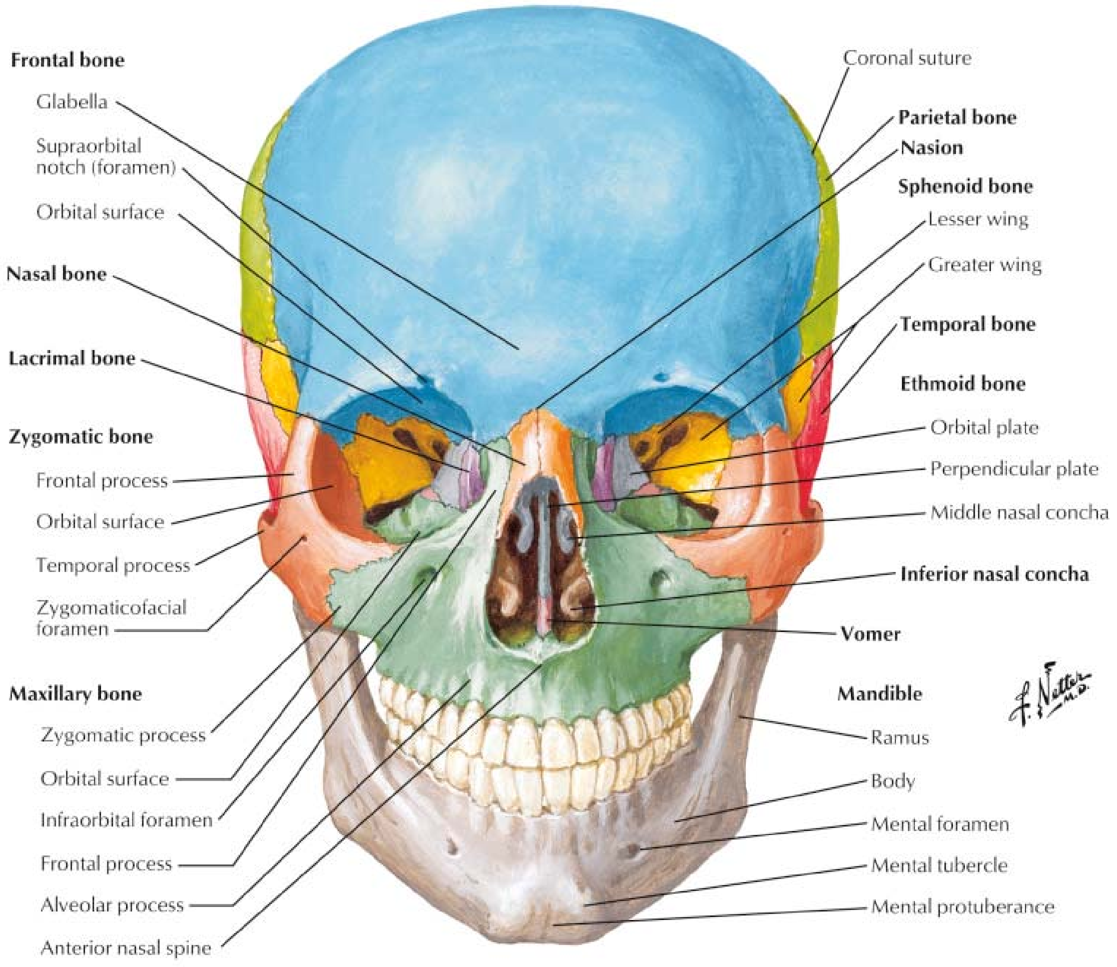
Black: from internal carotid artery (via ophthalmic artery)

Red: from external carotid artery

Bones and Ligaments

Plate 11 Skull: Anterior View

See also **Plate 13** (s0060)


Frontal bone
Glabella
Supraorbital notch (foramen)
Orbital surface
Nasal bone
Lacrimal bone
Zygomatic bone
Frontal process
Orbital surface
Temporal process
Zygomaticofacial foramen
Maxillary bone
Zygomatic process
Orbital surface
Infraorbital foramen
Frontal process
Alveolar process
Anterior nasal spine
Coronal suture
Parietal bone
Nasion
Sphenoid bone
Lesser wing
Greater wing
Temporal bone
Ethmoid bone
Orbital plate
Perpendicular plate
Middle nasal concha
Inferior nasal concha
Vomer
Mandible
Ramus
Body
Mental foramen
Mental tubercle
Mental protuberance
F. Netter M.D.

Right orbit: frontal view

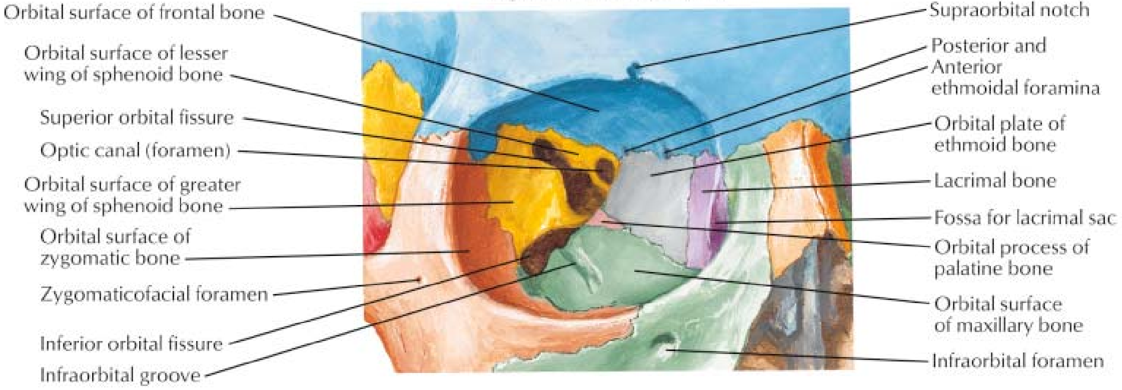
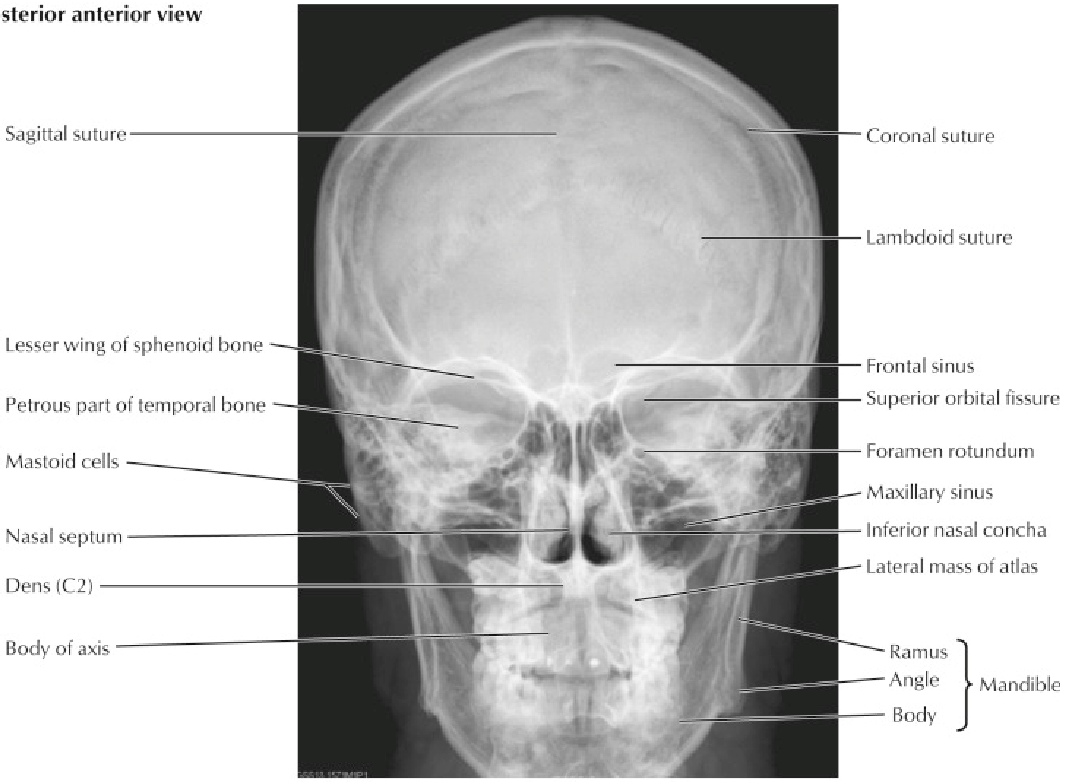

Orbital surface of frontal bone
Orbital surface of lesser wing of sphenoid bone
Superior orbital fissure
Optic canal (foramen)
Orbital surface of greater wing of sphenoid bone
Orbital surface of zygomatic bone
Zygomaticofacial foramen
Inferior orbital fissure
Infraorbital groove
Supraorbital notch
Posterior and Anterior ethmoidal foramina
Orbital plate of ethmoid bone
Lacrimal bone
Fossa for lacrimal sac
Orbital process of palatine bone
Orbital surface of maxillary bone
Infraorbital foramen

Plate 12 Skull: Radiographs

See also **Plate 11** (s0050)

Posterior anterior view


Sagittal suture
Coronal suture
Lambdoid suture
Lesser wing of sphenoid bone
Frontal sinus
Petrous part of temporal bone
Superior orbital fissure
Mastoid cells
Foramen rotundum
Maxillary sinus
Nasal septum
Inferior nasal concha
Dens (C2)
Lateral mass of atlas
Body of axis
Ramus
Angle
Body
Mandible

Waters' view

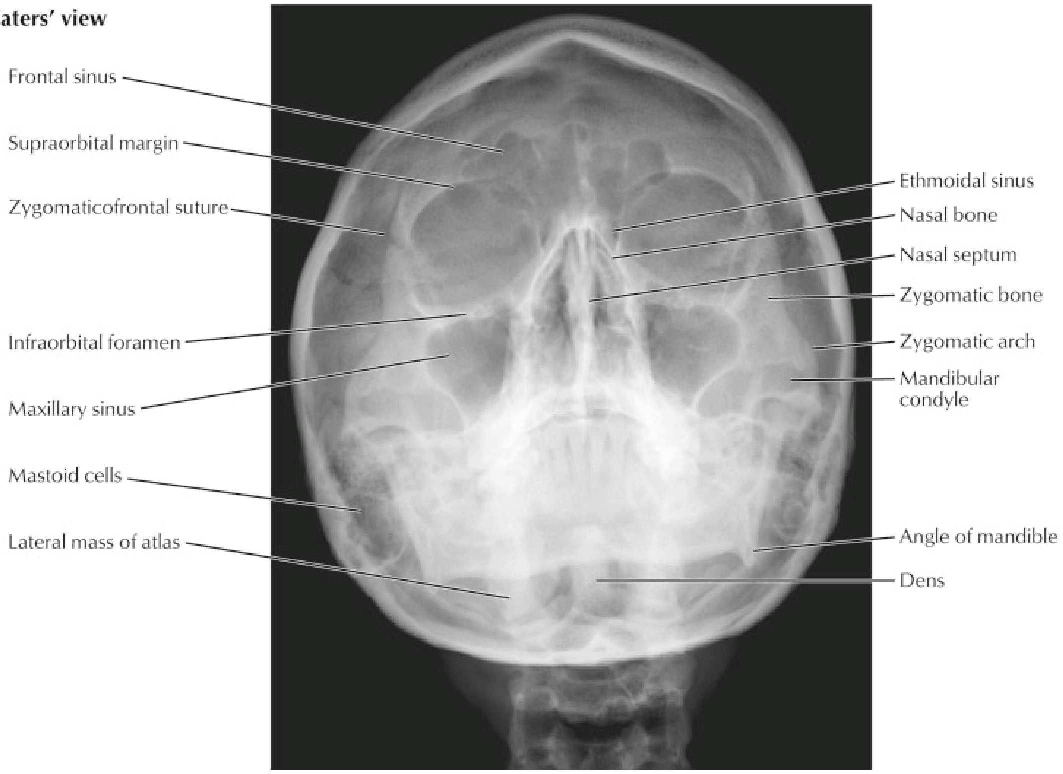
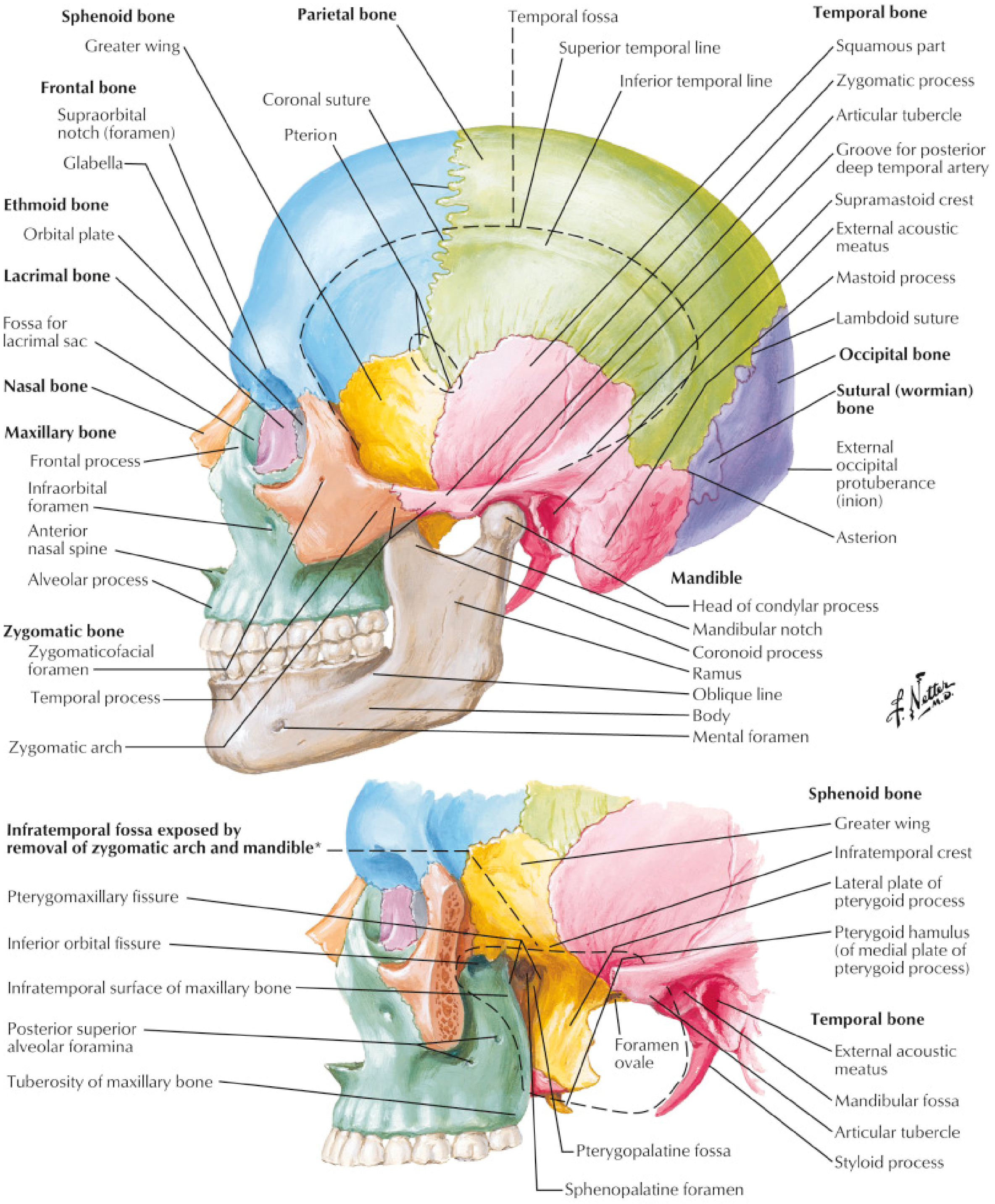

Frontal sinus
Supraorbital margin
Ethmoidal sinus
Zygomaticofrontal suture
Nasal bone
Nasal septum
Zygomatic bone
Infraorbital foramen
Zygomatic arch
Mandibular condyle
Maxillary sinus
Mastoid cells
Angle of mandible
Lateral mass of atlas
Dens

Plate 13 Skull: Lateral View

See also **Plates 14** (s0065) , **15** (s0070) , **22** (s0105)


Sphenoid bone
Greater wing
Frontal bone
Supraorbital notch (foramen)
Glabella
Ethmoid bone
Orbital plate
Lacrimal bone
Fossa for lacrimal sac
Nasal bone
Maxillary bone
Frontal process
Infraorbital foramen
Anterior nasal spine
Alveolar process
Zygomatic bone
Zygomaticofacial foramen
Temporal process
Zygomatic arch
Parietal bone
Coronal suture
Pterion
Temporal fossa
Superior temporal line
Inferior temporal line
Temporal bone
Squamous part
Zygomatic process
Articular tubercle
Groove for posterior deep temporal artery
Supramastoid crest
External acoustic meatus
Mastoid process
Lambdoid suture
Occipital bone
Sutural (wormian) bone
External occipital protuberance (inion)
Asterion
Mandible
Head of condylar process
Mandibular notch
Coronoid process
Ramus
Oblique line
Body
Mental foramen
Infratemporal fossa exposed by removal of zygomatic arch and mandible*
Pterygomaxillary fissure
Inferior orbital fissure
Infratemporal surface of maxillary bone
Posterior superior alveolar foramina
Tuberosity of maxillary bone
Sphenoid bone
Greater wing
Infratemporal crest
Lateral plate of pterygoid process
Pterygoid hamulus (of medial plate of pterygoid process)
Temporal bone
External acoustic meatus
Mandibular fossa
Articular tubercle
Styloid process
Foramen ovale
Pterygopalatine fossa
Sphenopalatine foramen

**Superficially, mastoid process forms posterior boundary.*

Plate 14 Skull: Lateral Radiograph

See also **Plate 15** (s0070)

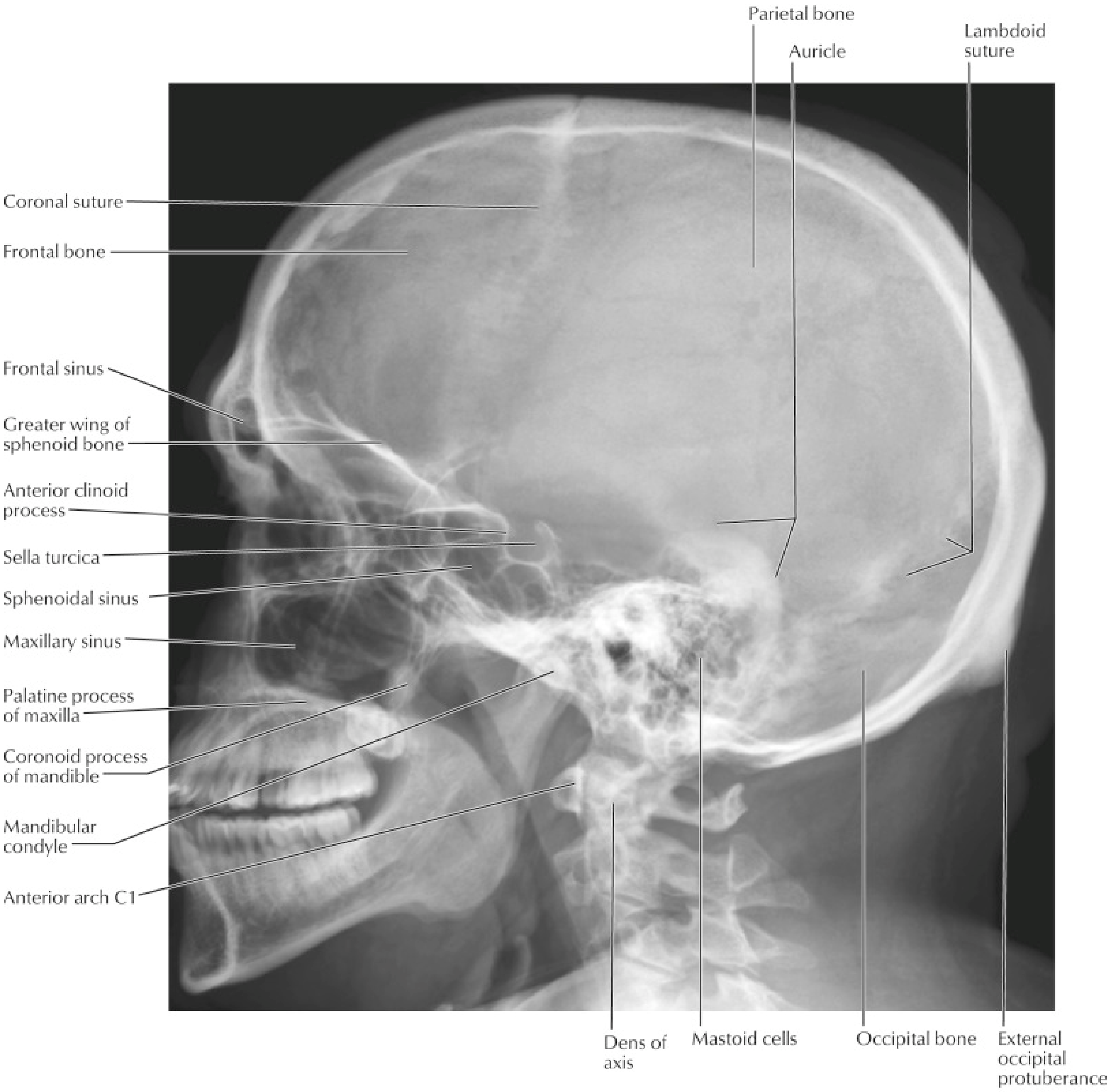
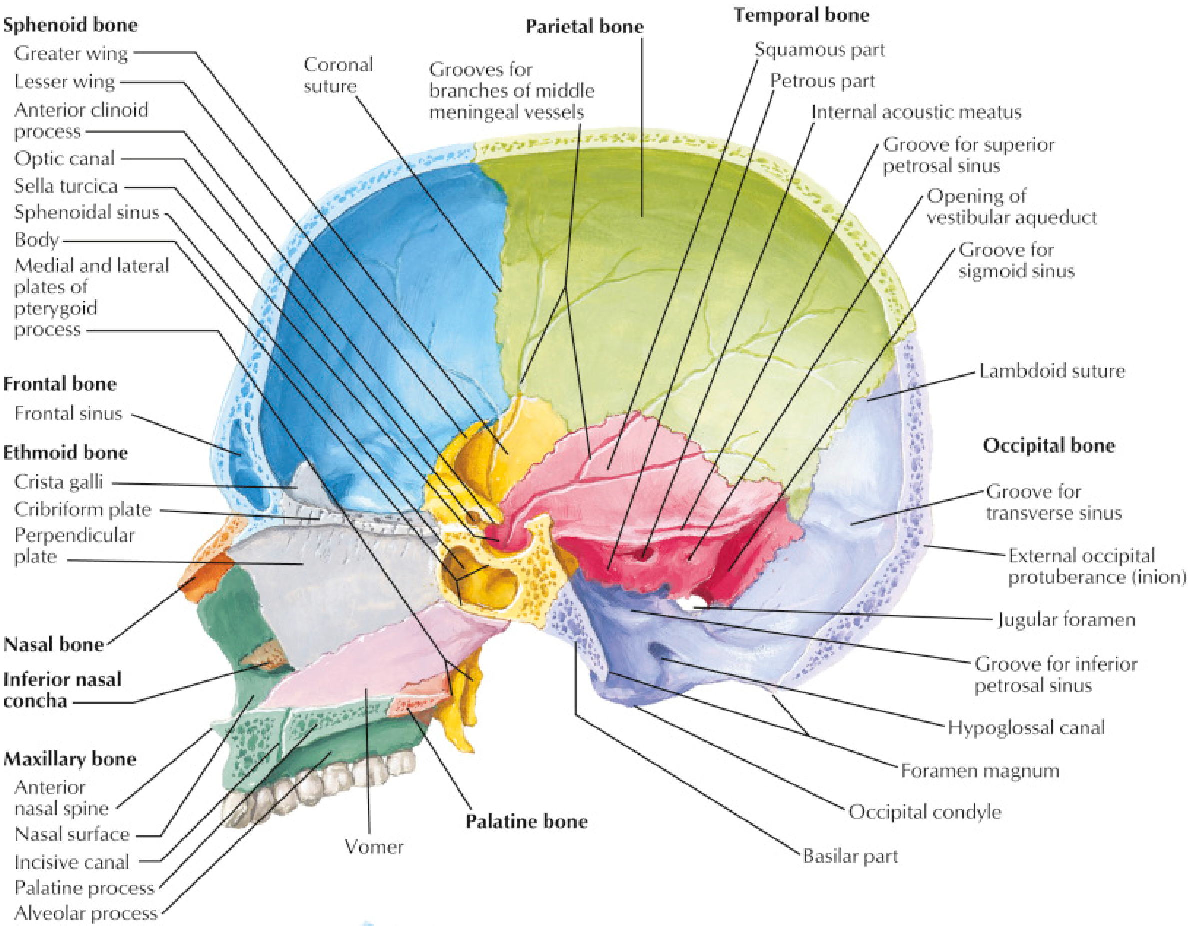
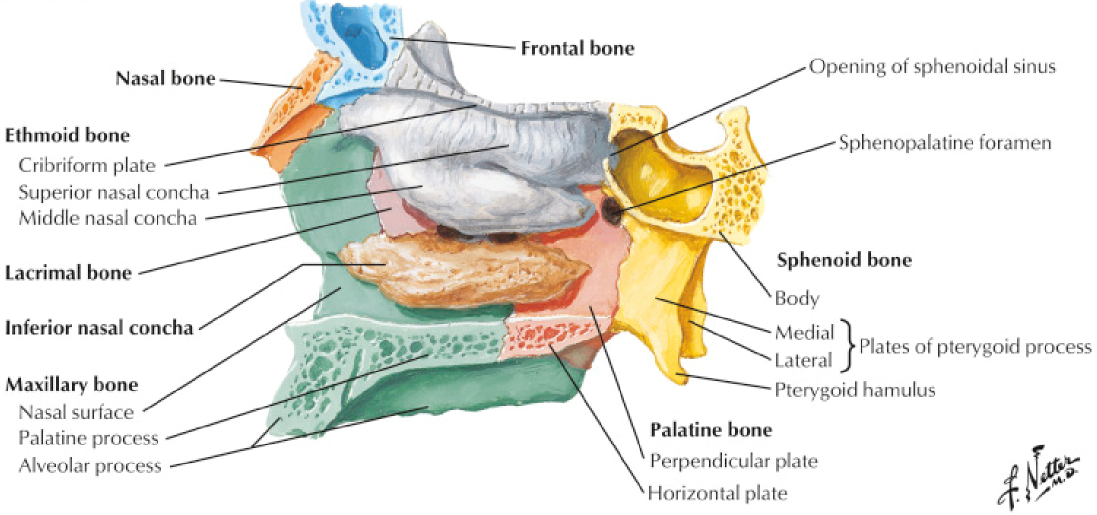

Parietal bone
Auricle
Lambdoid suture
Coronal suture
Frontal bone
Frontal sinus
Greater wing of sphenoid bone
Anterior clinoid process
Sella turcica
Sphenoidal sinus
Maxillary sinus
Palatine process of maxilla
Coronoid process of mandible
Mandibular condyle
Anterior arch C1
Dens of axis
Mastoid cells
Occipital bone
External occipital protuberance

Plate 15 Skull: Midsagittal Section

See also **Plates 44** (s0225) , **46** (s0235)


Sphenoid bone
Greater wing
Lesser wing
Anterior clinoid process
Optic canal
Sella turcica
Sphenoidal sinus
Body
Medial and lateral plates of pterygoid process
Frontal bone
Frontal sinus
Ethmoid bone
Crista galli
Cribriform plate
Perpendicular plate
Nasal bone
Inferior nasal concha
Maxillary bone
Anterior nasal spine
Nasal surface
Incisive canal
Palatine process
Alveolar process
Coronal suture
Grooves for branches of middle meningeal vessels
Parietal bone
Temporal bone
Squamous part
Petrous part
Internal acoustic meatus
Groove for superior petrosal sinus
Opening of vestibular aqueduct
Groove for sigmoid sinus
Lambdoid suture
Occipital bone
Groove for transverse sinus
External occipital protuberance (inion)
Jugular foramen
Groove for inferior petrosal sinus
Hypoglossal canal
Foramen magnum
Occipital condyle
Basilar part
Vomer
Palatine bone


Frontal bone
Nasal bone
Ethmoid bone
Cribriform plate
Superior nasal concha
Middle nasal concha
Lacrimal bone
Inferior nasal concha
Maxillary bone
Nasal surface
Palatine process
Alveolar process
Opening of sphenoidal sinus
Sphenopalatine foramen
Sphenoid bone
Body
Medial
Lateral
Plates of pterygoid process
Pterygoid hamulus
Palatine bone
Perpendicular plate
Horizontal plate
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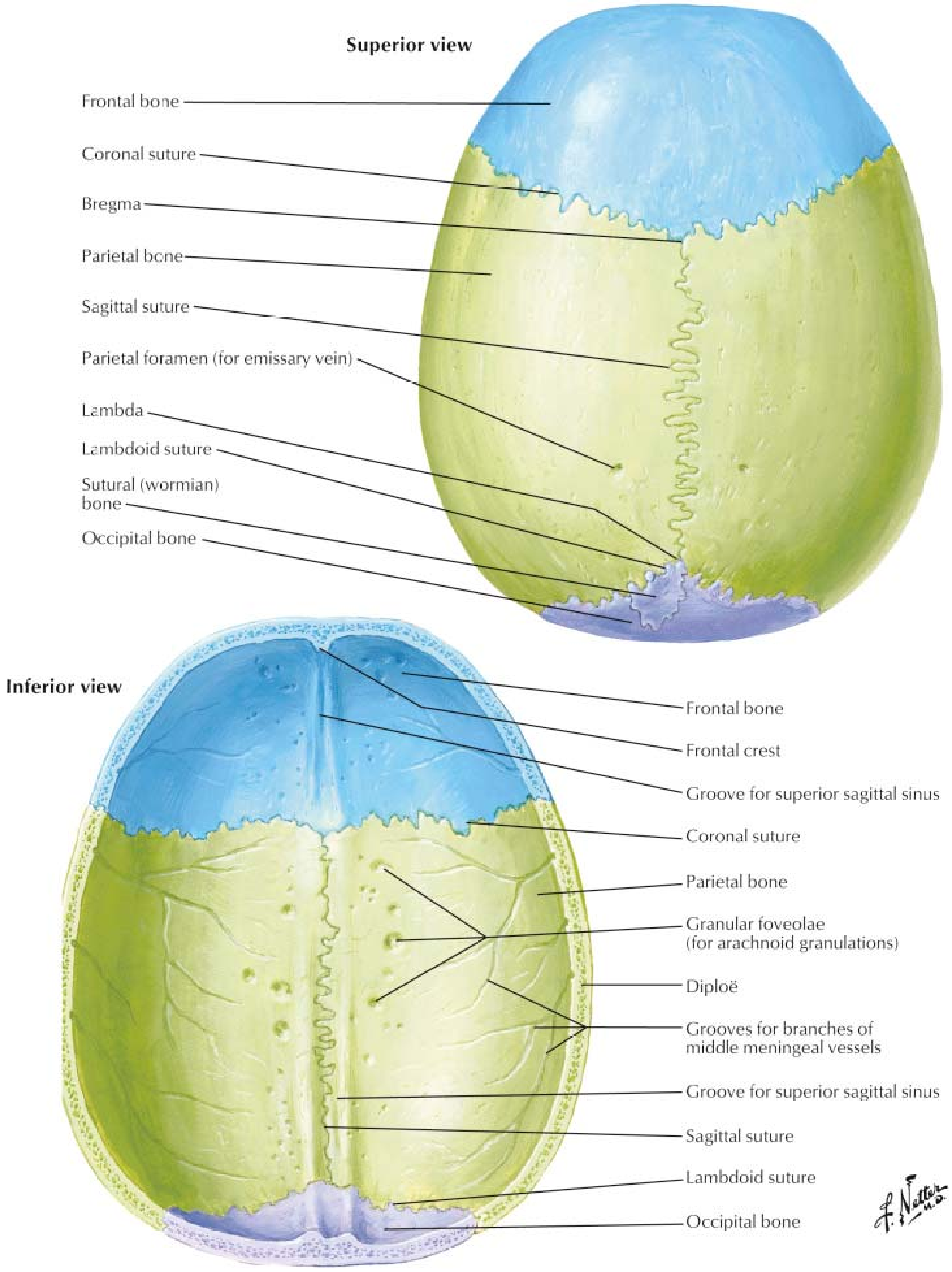
View of lateral nasal wall with nasal septum removed

Plate 16 Calvaria

See also **Plates 111** (s0590) , **112** (s0595)



Superior view

Frontal bone
Coronal suture
Bregma
Parietal bone
Sagittal suture
Parietal foramen (for emissary vein)
Lambda
Lambdoid suture
Sutural (wormian) bone
Occipital bone

Inferior view

Frontal bone
Frontal crest
Groove for superior sagittal sinus
Coronal suture
Parietal bone
Granular foveolae (for arachnoid granulations)
Diploë
Grooves for branches of middle meningeal vessels
Groove for superior sagittal sinus
Sagittal suture
Lambdoid suture
Occipital bone

Plate 17 Cranial Base: Inferior View

See also **Plate 19** (s0090)

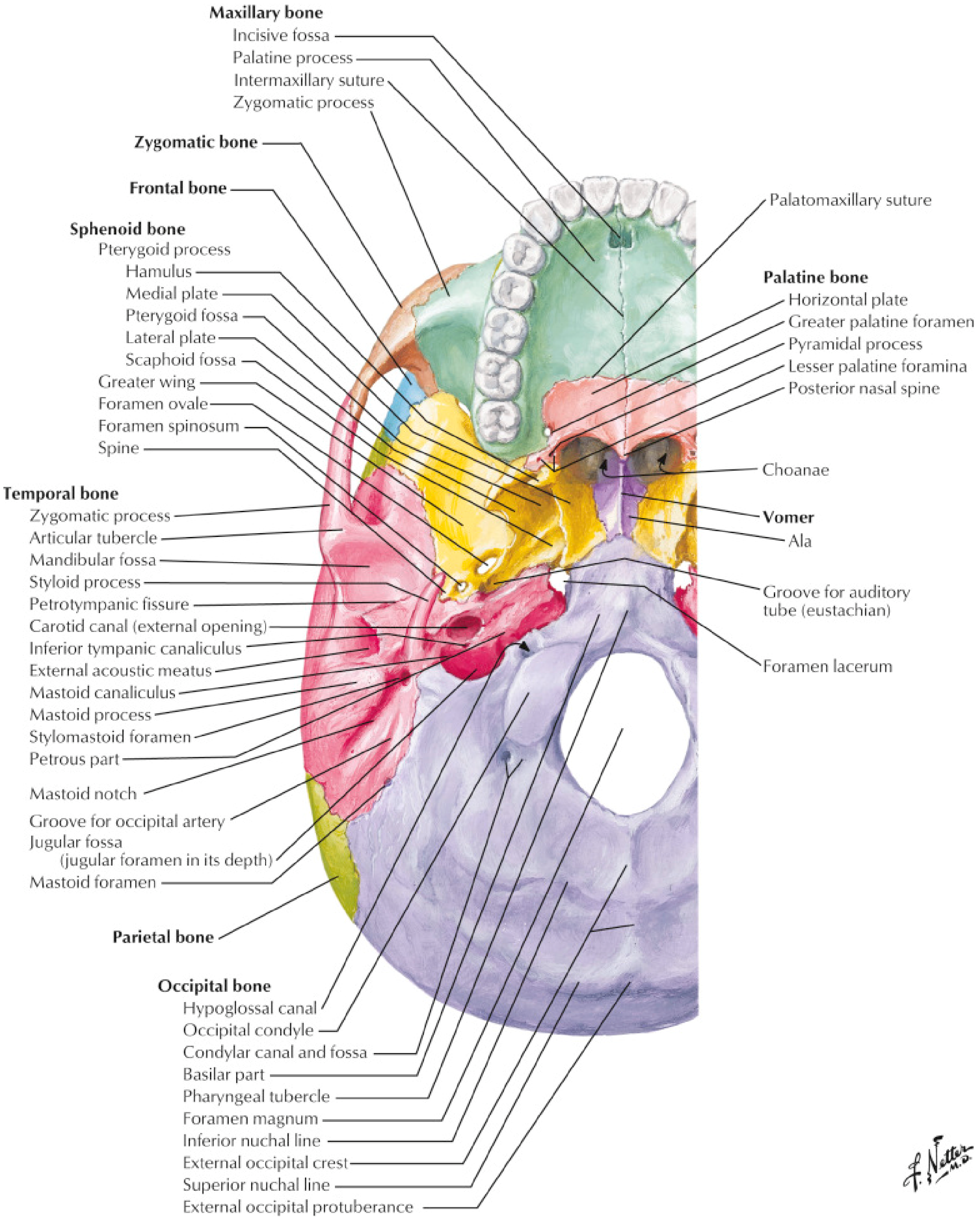

Maxillary bone
Incisive fossa
Palatine process
Intermaxillary suture
Zygomatic process
Zygomatic bone
Frontal bone
Sphenoid bone
Pterygoid process
Hamulus
Medial plate
Pterygoid fossa
Lateral plate
Scaphoid fossa
Greater wing
Foramen ovale
Foramen spinosum
Spine
Temporal bone
Zygomatic process
Articular tubercle
Mandibular fossa
Styloid process
Petrotympanic fissure
Carotid canal (external opening)
Inferior tympanic canaliculus
External acoustic meatus
Mastoid canaliculus
Mastoid process
Stylomastoid foramen
Petrous part
Mastoid notch
Groove for occipital artery
Jugular fossa
(jugular foramen in its depth)
Mastoid foramen
Parietal bone
Occipital bone
Hypoglossal canal
Occipital condyle
Condylar canal and fossa
Basilar part
Pharyngeal tubercle
Foramen magnum
Inferior nuchal line
External occipital crest
Superior nuchal line
External occipital protuberance
Palatomaxillary suture
Palatine bone
Horizontal plate
Greater palatine foramen
Pyramidal process
Lesser palatine foramina
Posterior nasal spine
Choanae
Vomer
Ala
Groove for auditory
tube (eustachian)
Foramen lacerum
F. Netter M.D.

Plate 18 Cranial Base: Superior View

See also **Plates 20** (s0095) , **115** (s0610)

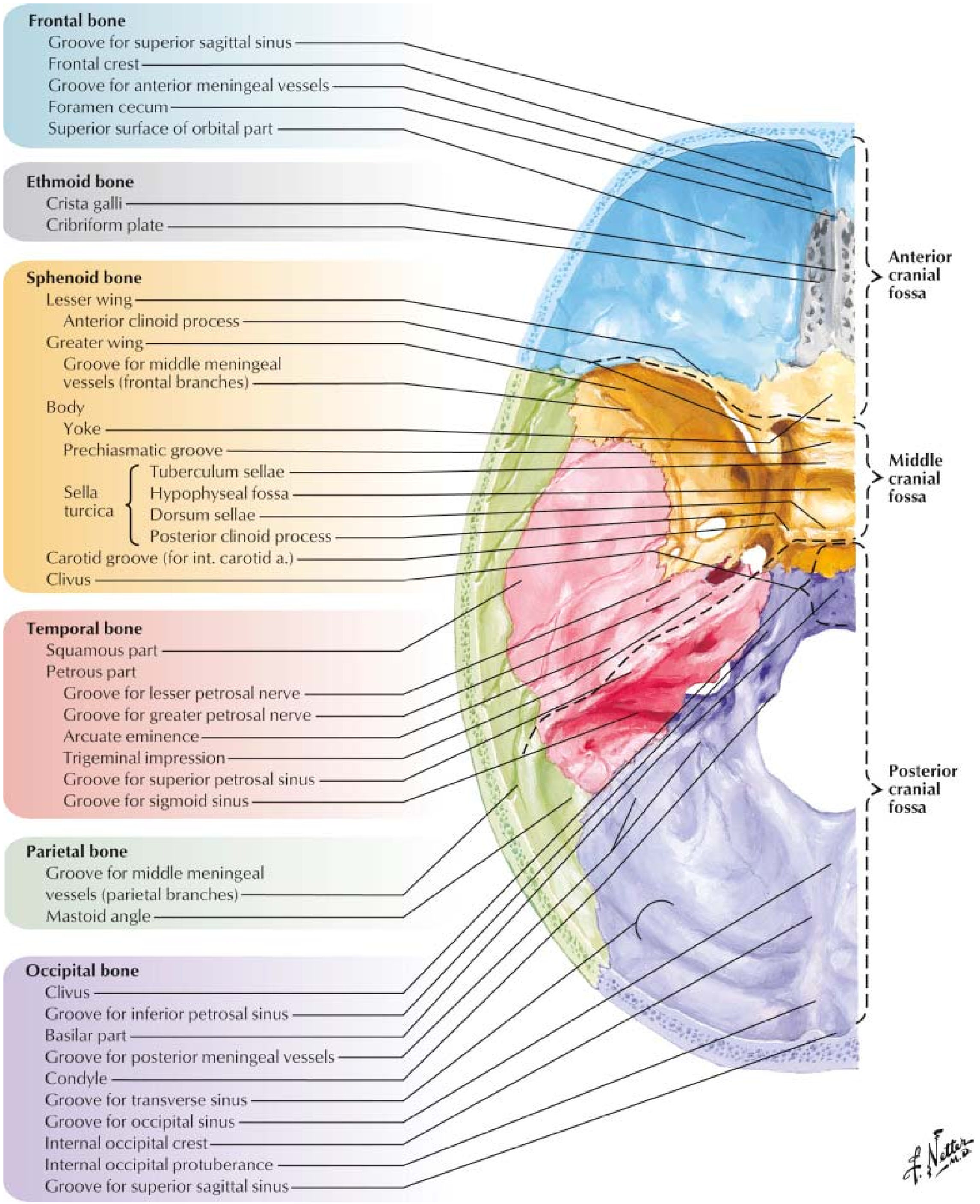

Frontal bone
Groove for superior sagittal sinus
Frontal crest
Groove for anterior meningeal vessels
Foramen cecum
Superior surface of orbital part
Ethmoid bone
Crista galli
Cribriform plate
Sphenoid bone
Lesser wing
Anterior clinoid process
Greater wing
Groove for middle meningeal vessels (frontal branches)
Body
Yoke
Prechiasmatic groove
Sella turcica
Tuberculum sellae
Hypophyseal fossa
Dorsum sellae
Posterior clinoid process
Carotid groove (for int. carotid a.)
Clivus
Temporal bone
Squamous part
Petrous part
Groove for lesser petrosal nerve
Groove for greater petrosal nerve
Arcuate eminence
Trigeminal impression
Groove for superior petrosal sinus
Groove for sigmoid sinus
Parietal bone
Groove for middle meningeal vessels (parietal branches)
Mastoid angle
Occipital bone
Clivus
Groove for inferior petrosal sinus
Basilar part
Groove for posterior meningeal vessels
Condyle
Groove for transverse sinus
Groove for occipital sinus
Internal occipital crest
Internal occipital protuberance
Groove for superior sagittal sinus
Anterior cranial fossa
Middle cranial fossa
Posterior cranial fossa
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Plate 19 Foramina and Canals of Cranial Base: Inferior View

See also **Plate 17** (s0080)

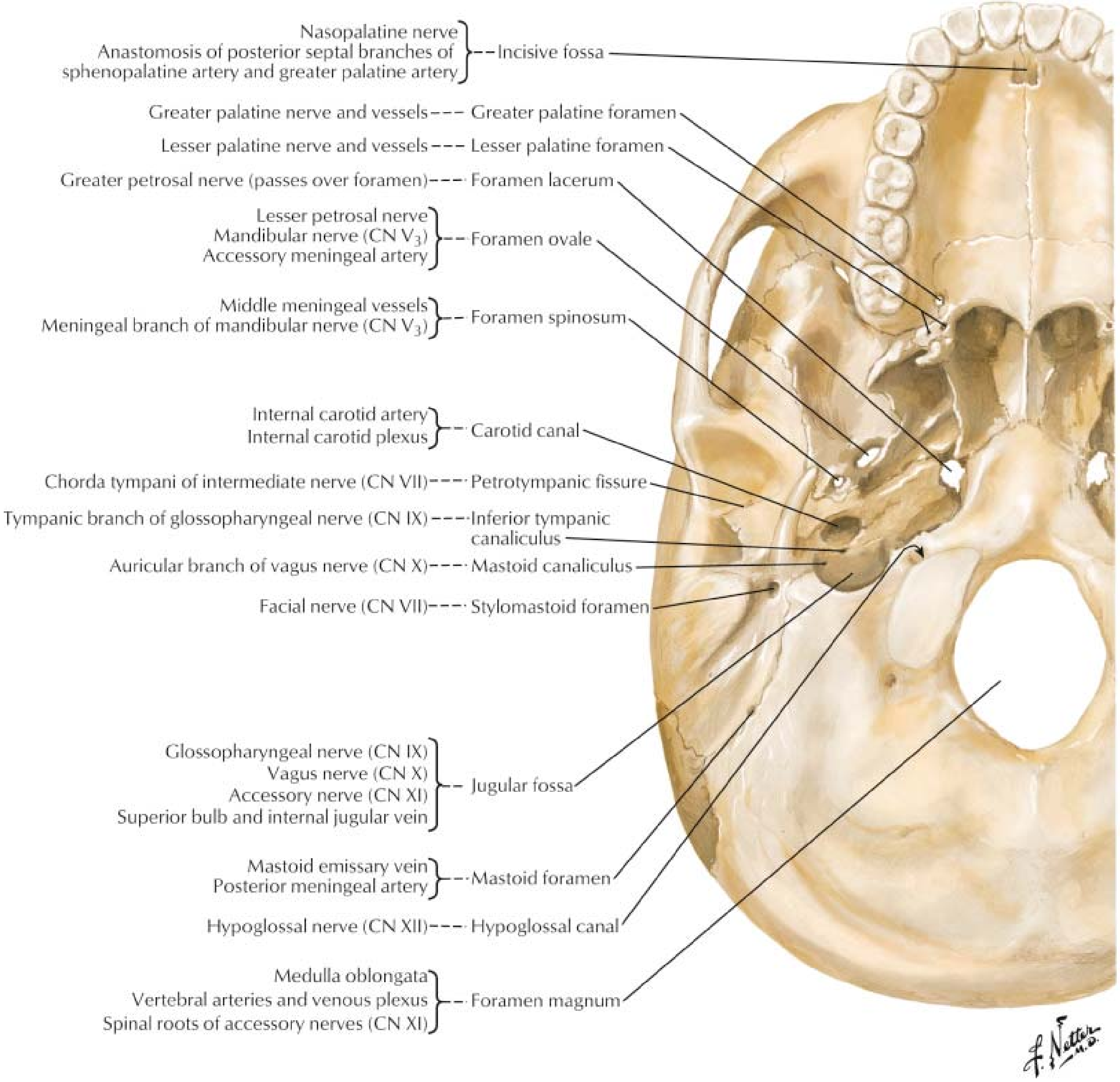
Nasopalatine nerve
Anastomosis of posterior septal branches of sphenopalatine artery and greater palatine artery
Incisive fossa
Greater palatine nerve and vessels
Greater palatine foramen
Lesser palatine nerve and vessels
Lesser palatine foramen
Greater petrosal nerve (passes over foramen)
Foramen lacerum
Lesser petrosal nerve
Mandibular nerve (CN V$_3$)
Accessory meningeal artery
Foramen ovale
Middle meningeal vessels
Meningeal branch of mandibular nerve (CN V$_3$)
Foramen spinosum
Internal carotid artery
Internal carotid plexus
Carotid canal
Chorda tympani of intermediate nerve (CN VII)
Petrotympanic fissure
Tympanic branch of glossopharyngeal nerve (CN IX)
Inferior tympanic canaliculus
Auricular branch of vagus nerve (CN X)
Mastoid canaliculus
Facial nerve (CN VII)
Stylomastoid foramen
Glossopharyngeal nerve (CN IX)
Vagus nerve (CN X)
Accessory nerve (CN XI)
Superior bulb and internal jugular vein
Jugular fossa
Mastoid emissary vein
Posterior meningeal artery
Mastoid foramen
Hypoglossal nerve (CN XII)
Hypoglossal canal
Medulla oblongata
Vertebral arteries and venous plexus
Spinal roots of accessory nerves (CN XI)
Foramen magnum

Plate 20 Foramina and Canals of Cranial Base: Superior View

See also **Plates 18** (s0085) , **115** (s0610)

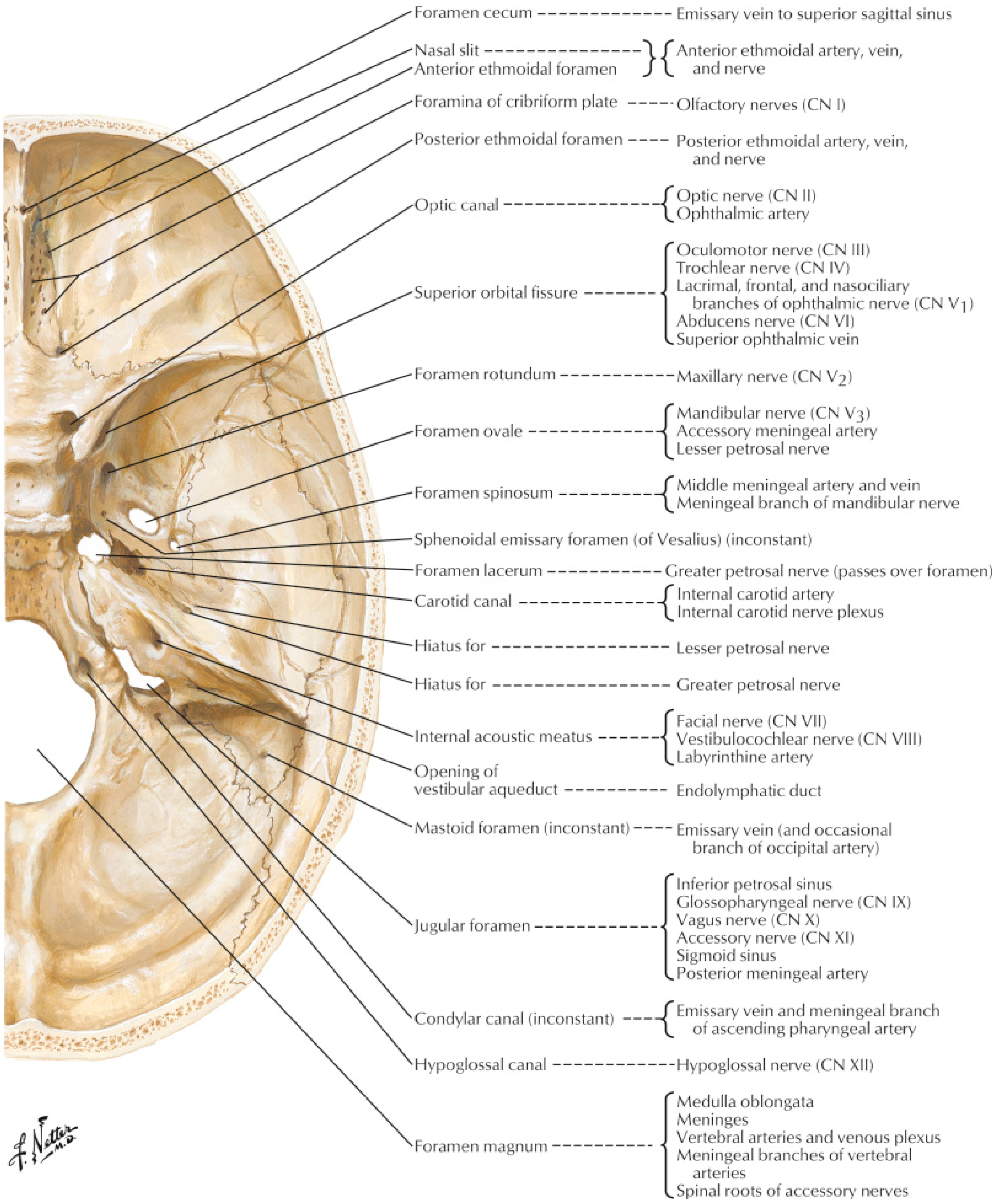
Foramen cecum
Emissary vein to superior sagittal sinus
Nasal slit
Anterior ethmoidal foramen
Anterior ethmoidal artery, vein, and nerve
Foramina of cribriform plate
Olfactory nerves (CN I)
Posterior ethmoidal foramen
Posterior ethmoidal artery, vein, and nerve
Optic canal
Optic nerve (CN II)
Ophthalmic artery
Superior orbital fissure
Oculomotor nerve (CN III)
Trochlear nerve (CN IV)
Lacrimal, frontal, and nasociliary branches of ophthalmic nerve (CN V1)
Abducens nerve (CN VI)
Superior ophthalmic vein
Foramen rotundum
Maxillary nerve (CN V2)
Foramen ovale
Mandibular nerve (CN V3)
Accessory meningeal artery
Lesser petrosal nerve
Foramen spinosum
Middle meningeal artery and vein
Meningeal branch of mandibular nerve
Sphenoidal emissary foramen (of Vesalius) (inconstant)
Foramen lacerum
Greater petrosal nerve (passes over foramen)
Carotid canal
Internal carotid artery
Internal carotid nerve plexus
Hiatus for
Lesser petrosal nerve
Hiatus for
Greater petrosal nerve
Internal acoustic meatus
Facial nerve (CN VII)
Vestibulocochlear nerve (CN VIII)
Labyrinthine artery
Opening of vestibular aqueduct
Endolymphatic duct
Mastoid foramen (inconstant)
Emissary vein (and occasional branch of occipital artery)
Jugular foramen
Inferior petrosal sinus
Glossopharyngeal nerve (CN IX)
Vagus nerve (CN X)
Accessory nerve (CN XI)
Sigmoid sinus
Posterior meningeal artery
Condylar canal (inconstant)
Emissary vein and meningeal branch of ascending pharyngeal artery
Hypoglossal canal
Hypoglossal nerve (CN XII)
Foramen magnum
Medulla oblongata
Meninges
Vertebral arteries and venous plexus
Meningeal branches of vertebral arteries
Spinal roots of accessory nerves
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Plate 21 Skull of Newborn

See also **Plates 13** (s0060) , **16** (s0075)

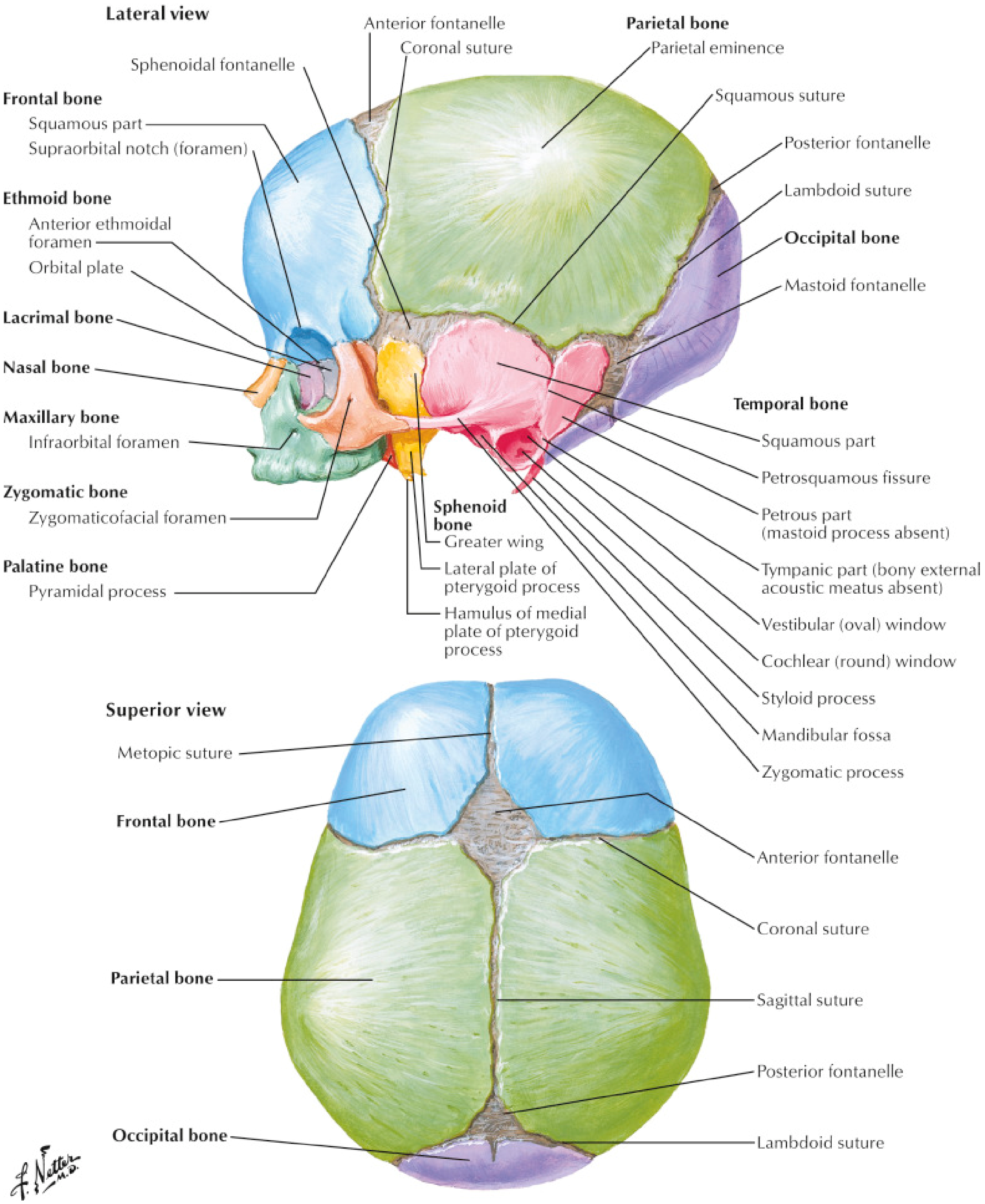

Lateral view
Anterior fontanelle
Coronal suture
Parietal bone
Parietal eminence
Sphenoidal fontanelle
Frontal bone
Squamous part
Supraorbital notch (foramen)
Squamous suture
Posterior fontanelle
Ethmoid bone
Anterior ethmoidal foramen
Orbital plate
Lambdoid suture
Occipital bone
Mastoid fontanelle
Lacrimal bone
Nasal bone
Maxillary bone
Infraorbital foramen
Temporal bone
Squamous part
Petrosquamous fissure
Petrous part (mastoid process absent)
Zygomatic bone
Zygomaticofacial foramen
Sphenoid bone
Greater wing
Lateral plate of pterygoid process
Hamulus of medial plate of pterygoid process
Palatine bone
Pyramidal process
Tympanic part (bony external acoustic meatus absent)
Vestibular (oval) window
Cochlear (round) window
Styloid process
Mandibular fossa
Zygomatic process
Superior view
Metopic suture
Frontal bone
Anterior fontanelle
Coronal suture
Parietal bone
Sagittal suture
Posterior fontanelle
Occipital bone
Lambdoid suture

Plate 22 Bony Framework of Head and Neck

See also **Plates 13** (s0060) , **26** (s0125)

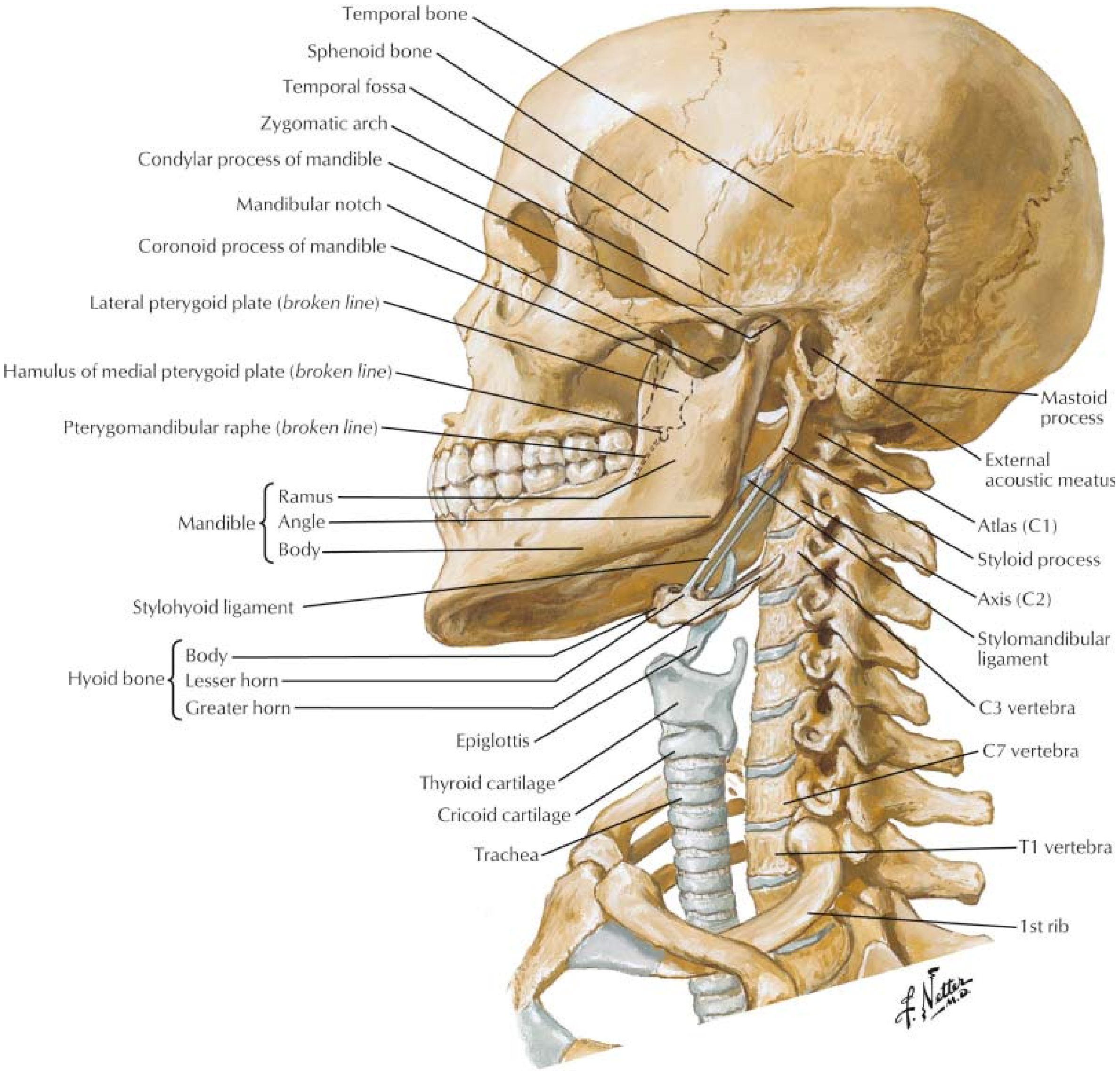
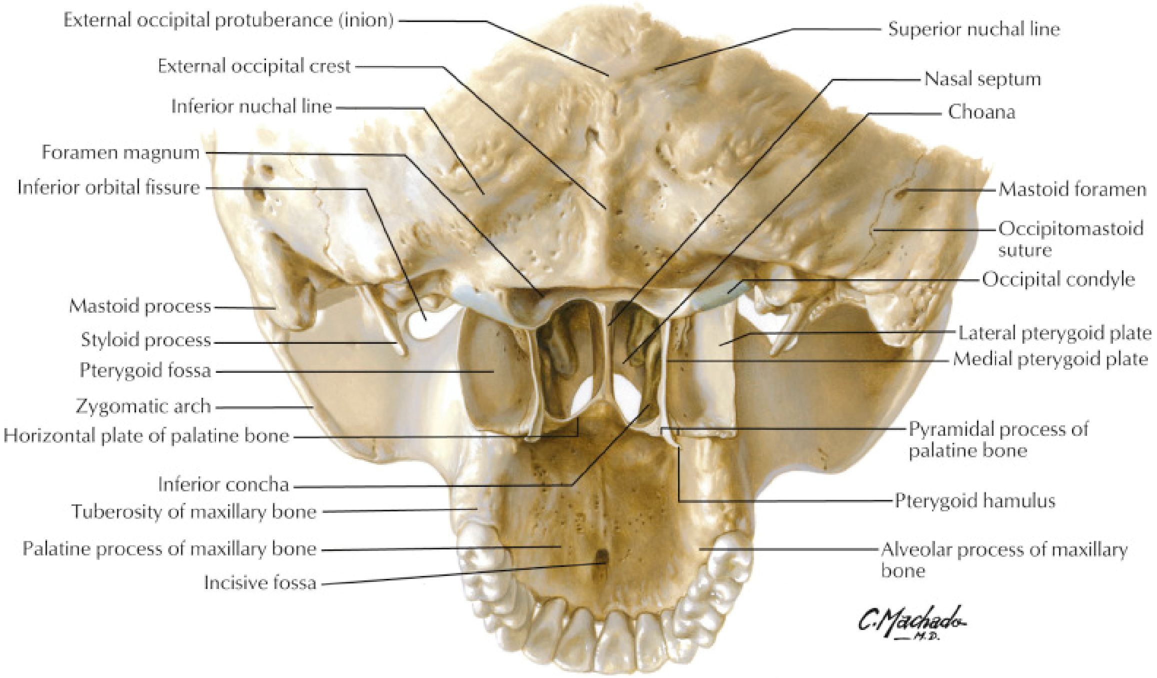

Temporal bone
Sphenoid bone
Temporal fossa
Zygomatic arch
Condylar process of mandible
Mandibular notch
Coronoid process of mandible
Lateral pterygoid plate (*broken line*)
Hamulus of medial pterygoid plate (*broken line*)
Pterygomandibular raphe (*broken line*)
Mandible
Ramus
Angle
Body
Stylohyoid ligament
Hyoid bone
Body
Lesser horn
Greater horn
Epiglottis
Thyroid cartilage
Cricoid cartilage
Trachea
Mastoid process
External acoustic meatus
Atlas (C1)
Styloid process
Axis (C2)
Stylomandibular ligament
C3 vertebra
C7 vertebra
T1 vertebra
1st rib
F. Netter M.D.

Plate 23 Pterygoid Fossae

See also **Plates 46** (s0235) , **47** (s0240) , **48** (s0245)

Posterior view


External occipital protuberance (inion)
External occipital crest
Inferior nuchal line
Foramen magnum
Inferior orbital fissure
Mastoid process
Styloid process
Pterygoid fossa
Zygomatic arch
Horizontal plate of palatine bone
Inferior concha
Tuberosity of maxillary bone
Palatine process of maxillary bone
Incisive fossa
Superior nuchal line
Nasal septum
Choana
Mastoid foramen
Occipitomastoid suture
Occipital condyle
Lateral pterygoid plate
Medial pterygoid plate
Pyramidal process of palatine bone
Pterygoid hamulus
Alveolar process of maxillary bone

Inferolateral view

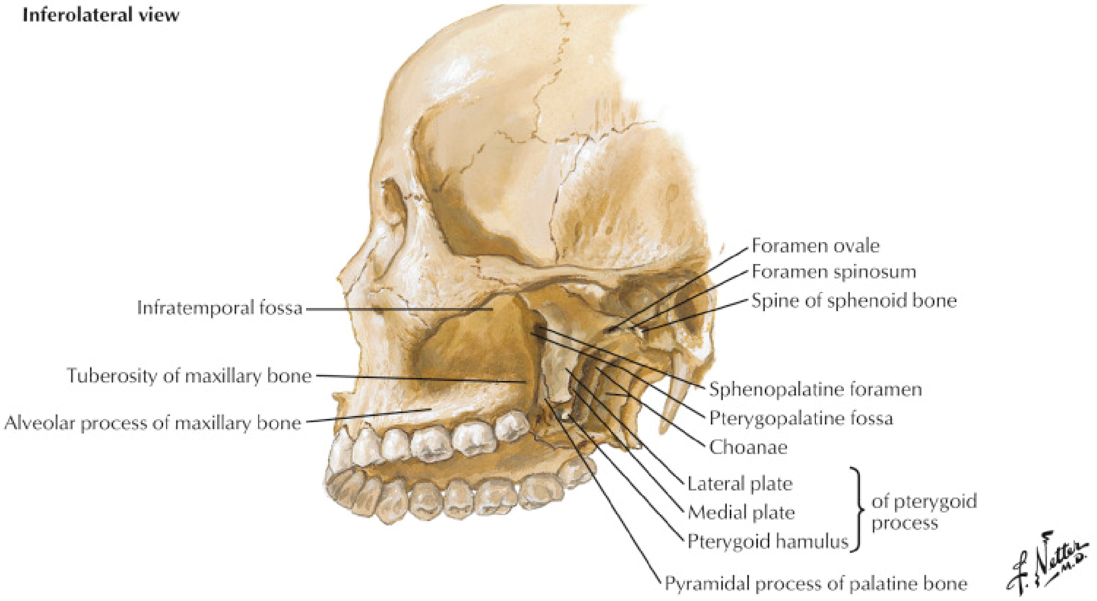
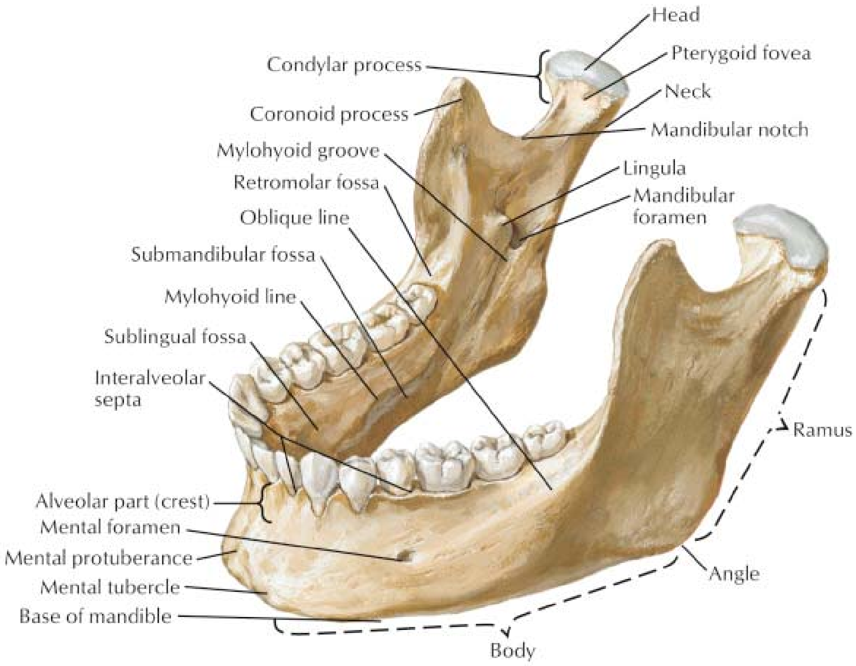
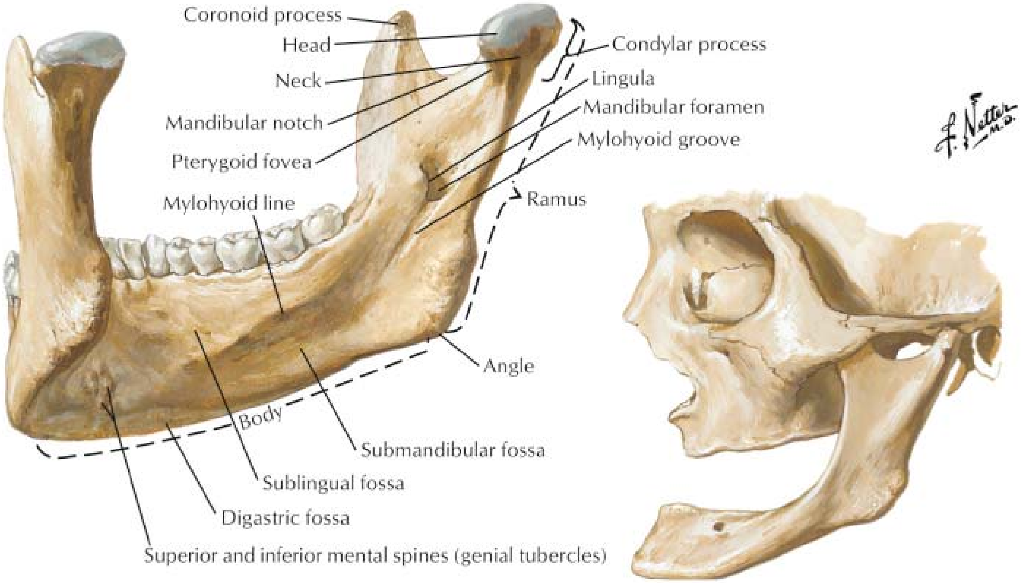

Infratemporal fossa
Tuberosity of maxillary bone
Alveolar process of maxillary bone
Foramen ovale
Foramen spinosum
Spine of sphenoid bone
Sphenopalatine foramen
Pterygopalatine fossa
Choanae
Lateral plate
Medial plate
Pterygoid hamulus
of pterygoid process
Pyramidal process of palatine bone

Plate 24 Mandible

See also **Plates 55** (s0280) , **56** (s0285)


Head
Condylar process
Pterygoid fovea
Neck
Coronoid process
Mandibular notch
Mylohyoid groove
Lingula
Retromolar fossa
Mandibular foramen
Oblique line
Submandibular fossa
Mylohyoid line
Sublingual fossa
Interalveolar septa
Ramus
Alveolar part (crest)
Mental foramen
Mental protuberance
Angle
Mental tubercle
Base of mandible
Body


Coronoid process
Head
Condylar process
Neck
Lingula
Mandibular foramen
Mandibular notch
Mylohyoid groove
Pterygoid fovea
Ramus
Mylohyoid line
Angle
Body
Submandibular fossa
Sublingual fossa
Digastric fossa
Superior and inferior mental spines (genial tubercles)
F. Netter M.D.

Mandible of aged person (edentulous)

Plate 25 Temporomandibular Joint

See also **Plate 56** (s0285)

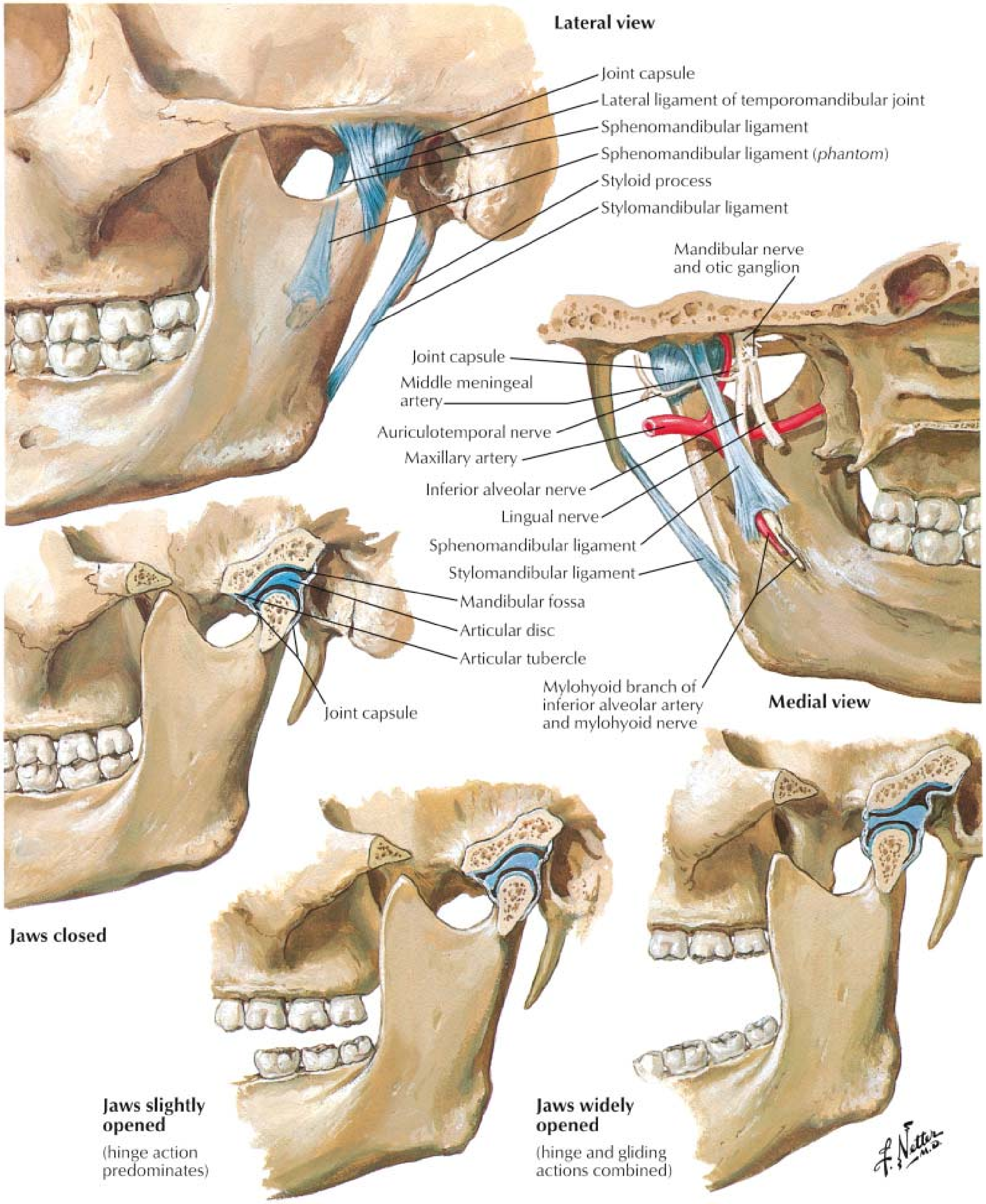
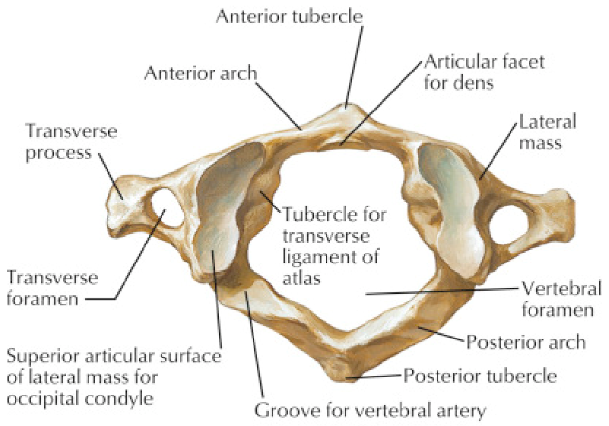
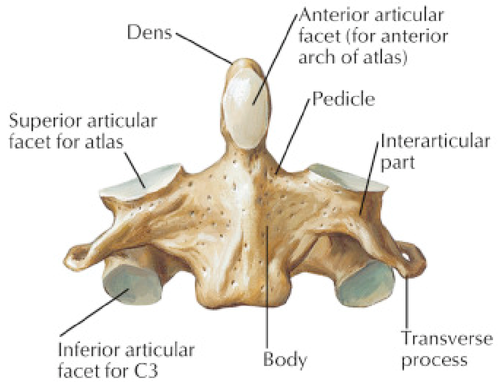

Lateral view
Joint capsule
Lateral ligament of temporomandibular joint
Sphenomandibular ligament
Sphenomandibular ligament (*phantom*)
Styloid process
Stylomandibular ligament
Mandibular nerve and otic ganglion
Joint capsule
Middle meningeal artery
Auriculotemporal nerve
Maxillary artery
Inferior alveolar nerve
Lingual nerve
Sphenomandibular ligament
Stylomandibular ligament
Mandibular fossa
Articular disc
Articular tubercle
Joint capsule
Mylohyoid branch of inferior alveolar artery and mylohyoid nerve
Medial view
Jaws closed
Jaws slightly opened
(hinge action predominates)
Jaws widely opened
(hinge and gliding actions combined)
F. Netter M.D.

Plate 26 Cervical Vertebrae: Atlas and Axis

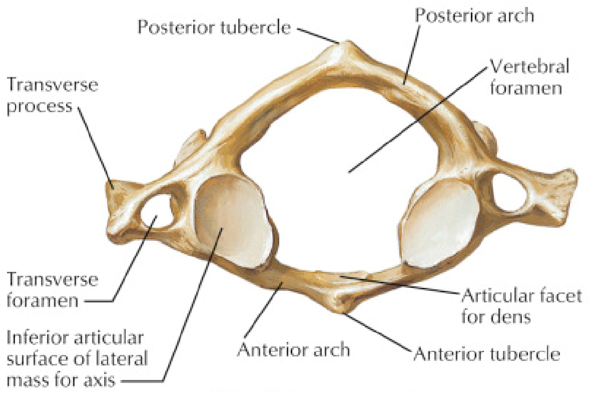
See also **Plates 28** (s0135) **, 30** (s0145)


Anterior tubercle
Anterior arch
Articular facet for dens
Transverse process
Lateral mass
Tubercle for transverse ligament of atlas
Transverse foramen
Vertebral foramen
Posterior arch
Superior articular surface of lateral mass for occipital condyle
Posterior tubercle
Groove for vertebral artery

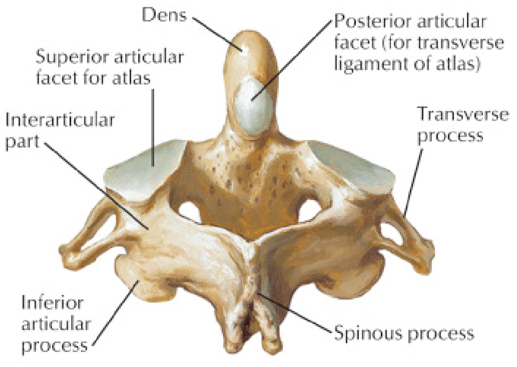
Atlas (C1): superior view


Dens
Anterior articular facet (for anterior arch of atlas)
Pedicle
Superior articular facet for atlas
Interarticular part
Inferior articular facet for C3
Body
Transverse process

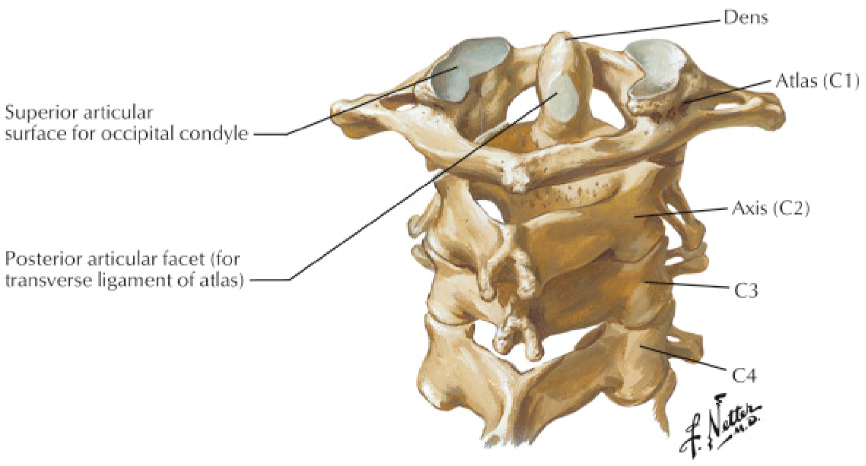
Axis (C2): anterior view


Posterior tubercle
Posterior arch
Vertebral foramen
Transverse process
Transverse foramen
Articular facet for dens
Inferior articular surface of lateral mass for axis
Anterior arch
Anterior tubercle

Atlas (C1): inferior view


Dens
Posterior articular facet (for transverse ligament of atlas)
Superior articular facet for atlas
Interarticular part
Transverse process
Inferior articular process
Spinous process

Axis (C2): posterosuperior view

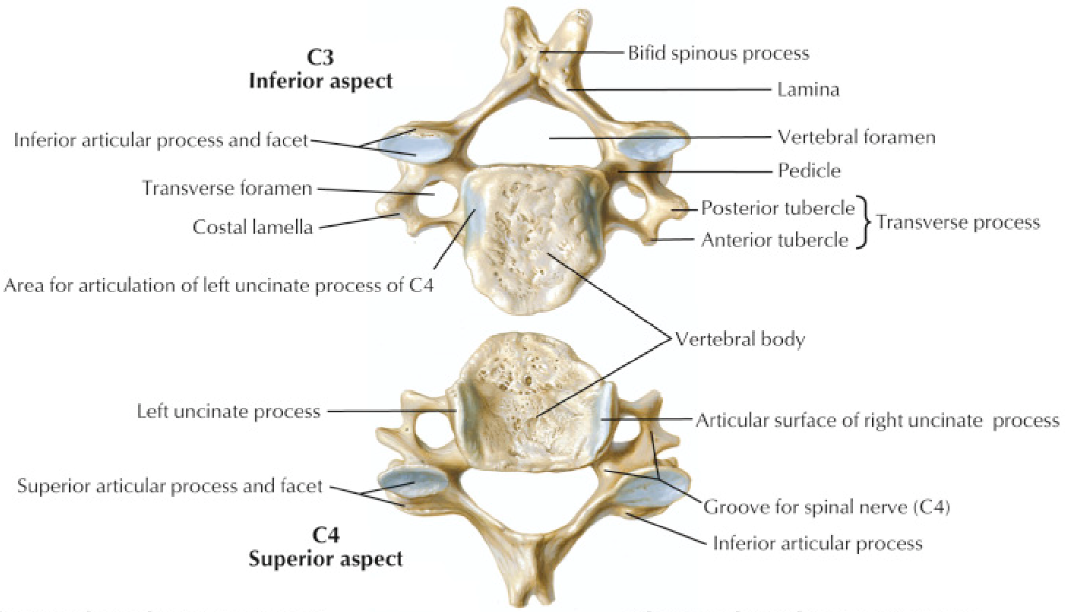

Dens
Atlas (C1)
Superior articular surface for occipital condyle
Axis (C2)
Posterior articular facet (for transverse ligament of atlas)
C3
C4
F. Netter M.D.

Upper cervical vertebrae, assembled: posterosuperior view

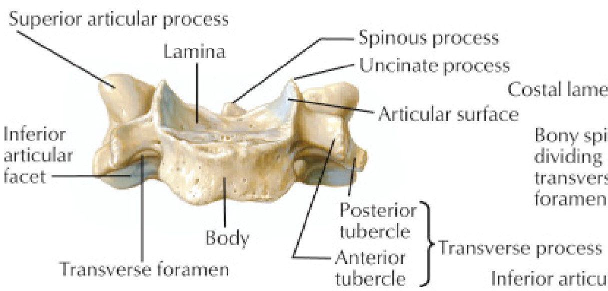
Plate 27 Cervical Vertebrae (continued)

See also **Plates 28** (s0135) , **29** (s0140)

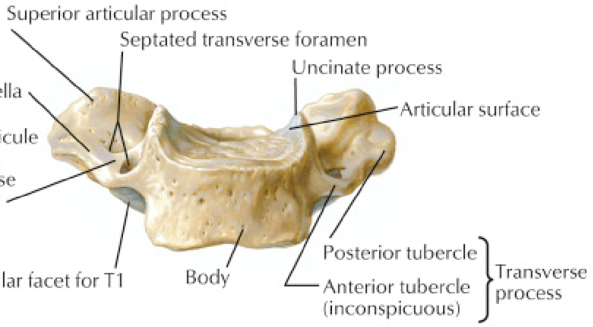
Inferior aspect of C3 and superior aspect of C4 showing the sites of the facet and uncovertebral articulations


C3
Inferior aspect
Bifid spinous process
Lamina
Inferior articular process and facet
Vertebral foramen
Pedicle
Transverse foramen
Posterior tubercle
Anterior tubercle
Transverse process
Costal lamella
Area for articulation of left uncinate process of C4
Vertebral body
Left uncinate process
Articular surface of right uncinate process
Superior articular process and facet
Groove for spinal nerve (C4)
Inferior articular process
C4
Superior aspect

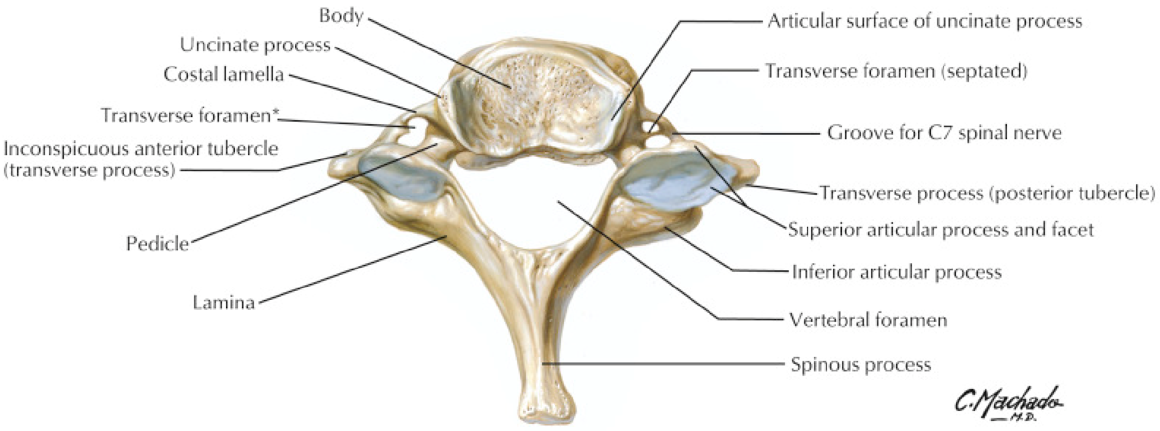
4th cervical vertebra: anterior view


Superior articular process
Lamina
Spinous process
Uncinate process
Articular surface
Inferior articular facet
Body
Transverse foramen
Posterior tubercle
Anterior tubercle
Transverse process

7th cervical vertebra: anterior view


Superior articular process
Septated transverse foramen
Uncinate process
Costal lamella
Articular surface
Bony spicule dividing transverse foramen
Inferior articular facet for T1
Body
Posterior tubercle
Anterior tubercle (inconspicuous)
Transverse process

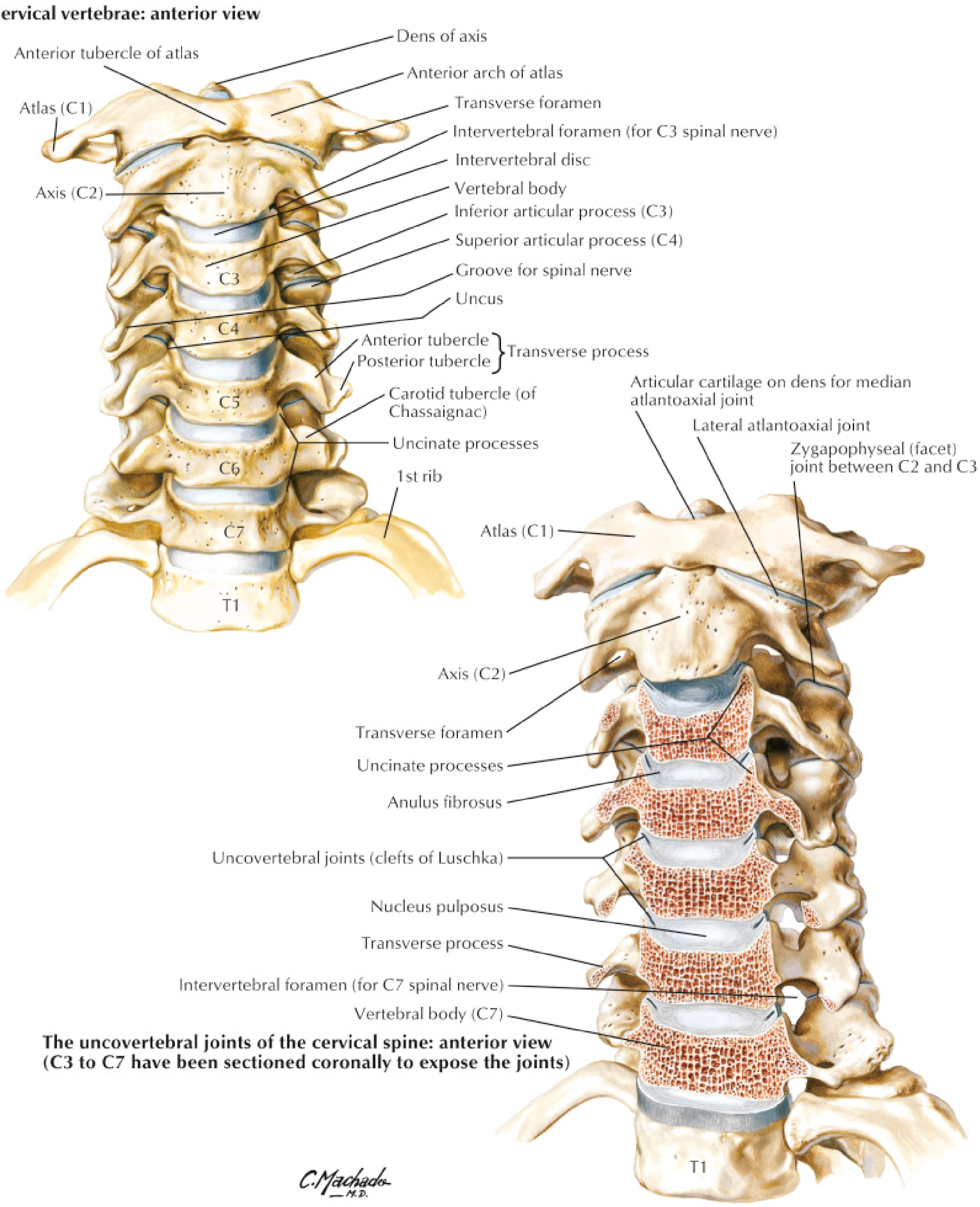
7th cervical vertebra (vertebra prominens): superior view


Body
Uncinate process
Costal lamella
Transverse foramen*
Inconspicuous anterior tubercle (transverse process)
Pedicle
Lamina
Articular surface of uncinate process
Transverse foramen (septated)
Groove for C7 spinal nerve
Transverse process (posterior tubercle)
Superior articular process and facet
Inferior articular process
Vertebral foramen
Spinous process

**The foramina transversaria of C7 transmit vertebral veins, but usually not the vertebral artery, and are asymmetrical in this specimen.*

Plate 28 Cervical Vertebrae: Uncovertebral Joints

See also **Plate 29** (s0140)



Cervical vertebrae: anterior view

The uncovertebral joints of the cervical spine: anterior view (C3 to C7 have been sectioned coronally to expose the joints)

Dens of axis
Anterior tubercle of atlas
Anterior arch of atlas
Atlas (C1)
Transverse foramen
Intervertebral foramen (for C3 spinal nerve)
Intervertebral disc
Axis (C2)
Vertebral body
Inferior articular process (C3)
Superior articular process (C4)
Groove for spinal nerve
C3
Uncus
C4
Anterior tubercle
Posterior tubercle
Transverse process
C5
Carotid tubercle (of Chassaignac)
Uncinate processes
C6
1st rib
C7
T1
Articular cartilage on dens for median atlantoaxial joint
Lateral atlantoaxial joint
Zygapophyseal (facet) joint between C2 and C3
Atlas (C1)
Axis (C2)
Transverse foramen
Uncinate processes
Anulus fibrosus
Uncovertebral joints (clefts of Luschka)
Nucleus pulposus
Transverse process
Intervertebral foramen (for C7 spinal nerve)
Vertebral body (C7)
T1
C. Machado M.D.

Plate 29 External Craniocervical Ligaments

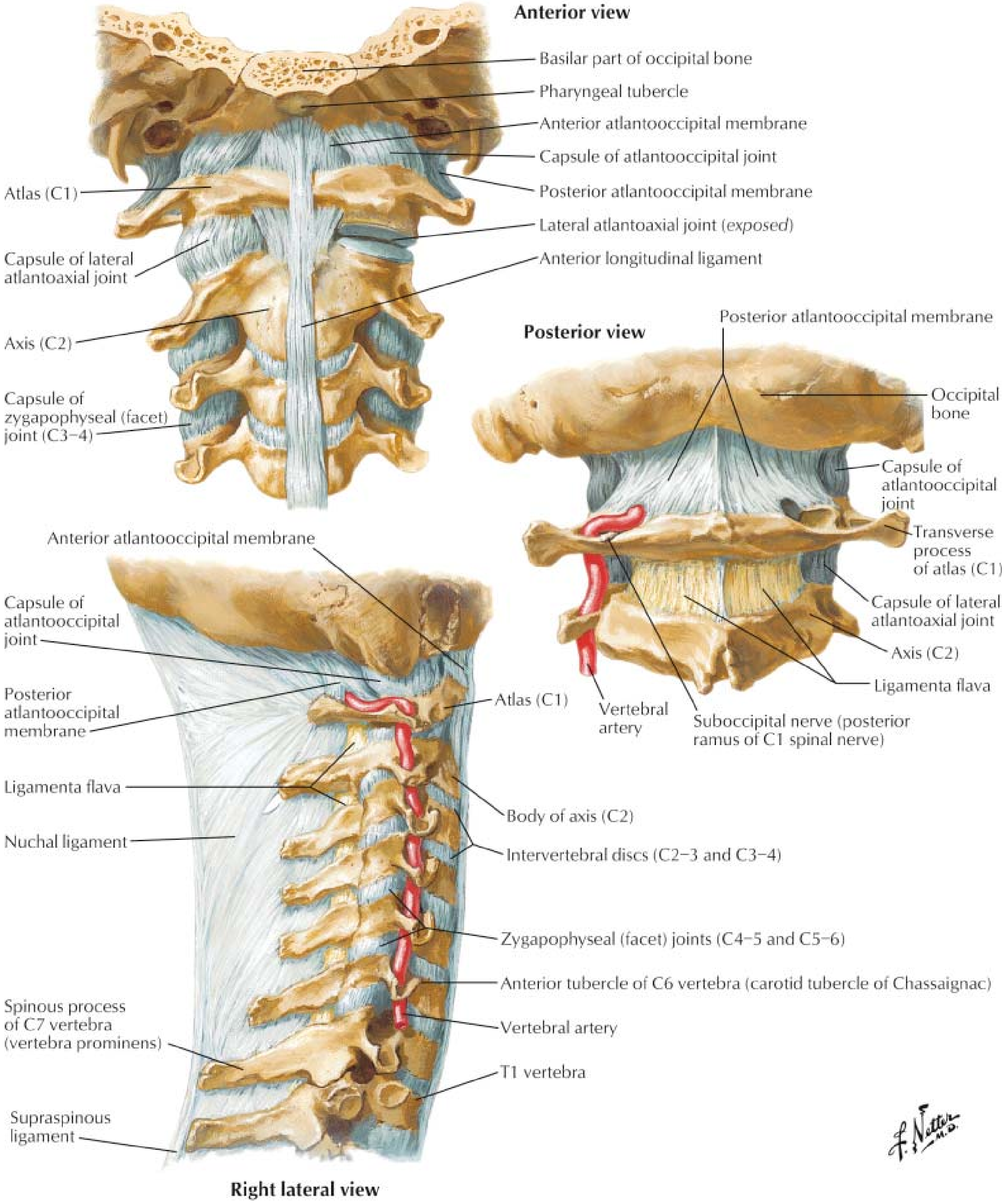
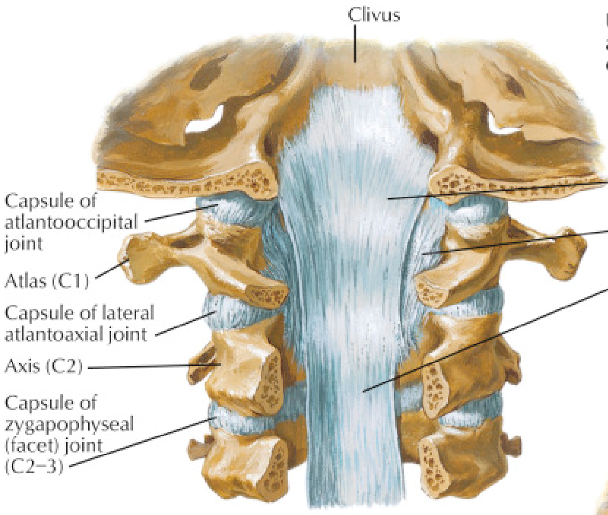
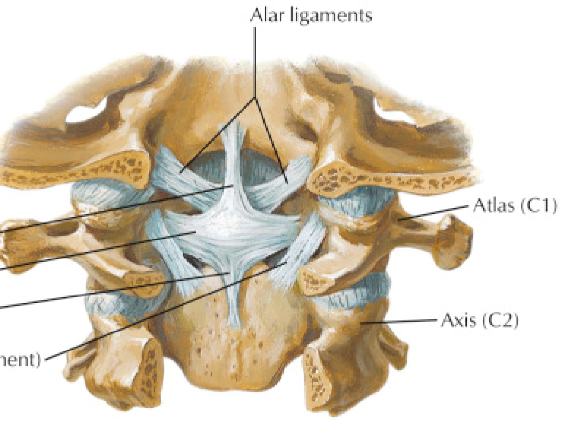

Anterior view
Basilar part of occipital bone
Pharyngeal tubercle
Anterior atlantooccipital membrane
Capsule of atlantooccipital joint
Atlas (C1)
Posterior atlantooccipital membrane
Lateral atlantoaxial joint (*exposed*)
Capsule of lateral atlantoaxial joint
Anterior longitudinal ligament
Axis (C2)
Capsule of zygapophyseal (facet) joint (C3–4)
Posterior view
Posterior atlantooccipital membrane
Occipital bone
Capsule of atlantooccipital joint
Transverse process of atlas (C1)
Capsule of lateral atlantoaxial joint
Axis (C2)
Ligamenta flava
Vertebral artery
Suboccipital nerve (posterior ramus of C1 spinal nerve)
Anterior atlantooccipital membrane
Capsule of atlantooccipital joint
Posterior atlantooccipital membrane
Atlas (C1)
Ligamenta flava
Body of axis (C2)
Nuchal ligament
Intervertebral discs (C2–3 and C3–4)
Zygapophyseal (facet) joints (C4–5 and C5–6)
Anterior tubercle of C6 vertebra (carotid tubercle of Chassaignac)
Spinous process of C7 vertebra (vertebra prominens)
Vertebral artery
T1 vertebra
Supraspinous ligament
F. Netter M.D.
Right lateral view

Plate 30 Internal Craniocervical Ligaments

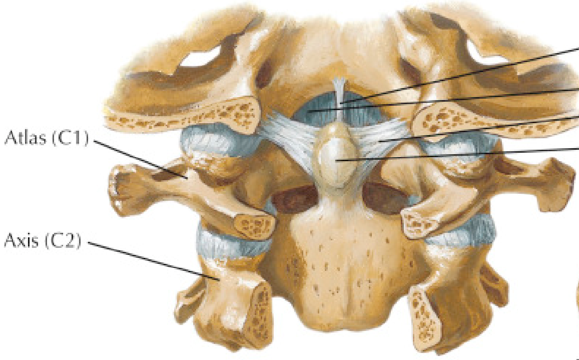
See also **Plate 26** (s0125)


Clivus
Tectorial membrane
Deeper (accessory) part of tectorial membrane (atlantoaxial ligament)
Posterior longitudinal ligament
Capsule of atlantooccipital joint
Atlas (C1)
Capsule of lateral atlantoaxial joint
Axis (C2)
Capsule of zygapophyseal (facet) joint (C2–3)

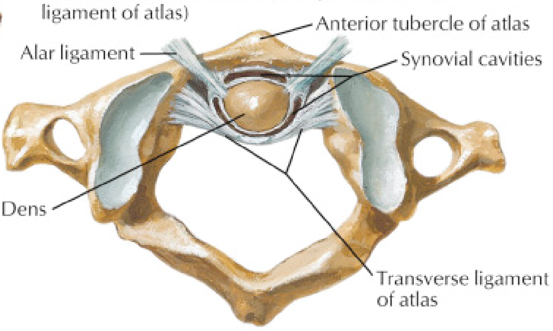
Upper part of vertebral canal with spinous processes and parts of vertebral arches removed to expose ligaments on posterior vertebral bodies: posterior view


Alar ligaments
Atlas (C1)
Cruciate ligament
Superior longitudinal band
Transverse ligament of atlas
Inferior longitudinal band
Axis (C2)
Deeper (accessory) part of tectorial membrane (atlantoaxial ligament)

Principal part of tectorial membrane removed to expose deeper ligaments: posterior view


Apical ligament of dens
Anterior atlantooccipital ligament
Alar ligament
Posterior articular facet of dens (for transverse ligament of atlas)
Atlas (C1)
Axis (C2)

Cruciate ligament removed to show deeper ligaments: posterior view


Anterior tubercle of atlas
Alar ligament
Synovial cavities
Dens
Transverse ligament of atlas

Median atlantoaxial joint: superior view

Neck

Plate 31 Muscles of Facial Expression: Lateral View

See also **Plates 34** (s0170) , **55** (s0280) , **56** (s0285)

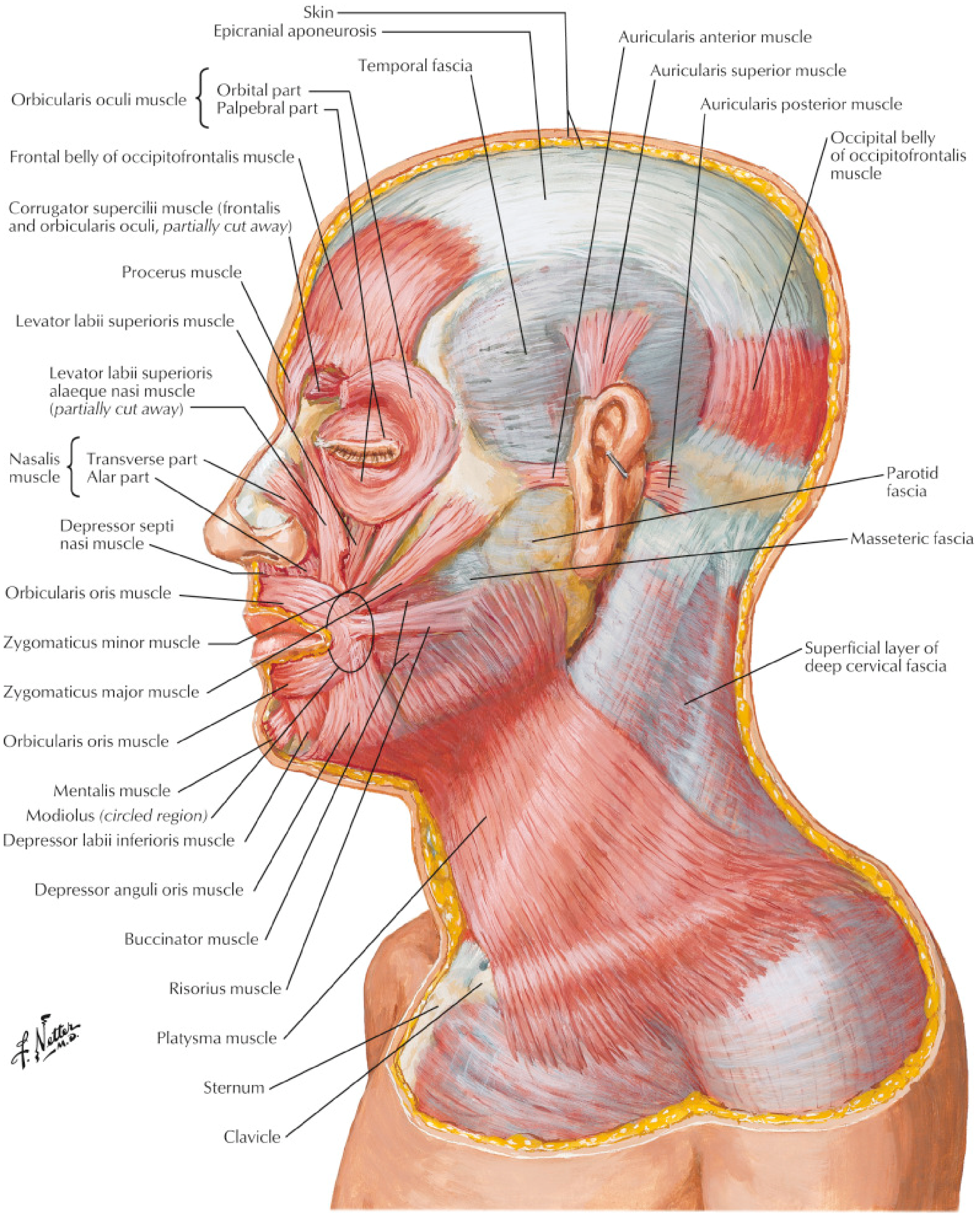

Skin
Epicranial aponeurosis
Temporal fascia
Auricularis anterior muscle
Auricularis superior muscle
Auricularis posterior muscle
Orbicularis oculi muscle
Orbital part
Palpebral part
Frontal belly of occipitofrontalis muscle
Occipital belly of occipitofrontalis muscle
Corrugator supercilii muscle (frontalis and orbicularis oculi, *partially cut away*)
Procerus muscle
Levator labii superioris muscle
Levator labii superioris alaeque nasi muscle (*partially cut away*)
Nasalis muscle
Transverse part
Alar part
Parotid fascia
Depressor septi nasi muscle
Masseteric fascia
Orbicularis oris muscle
Zygomaticus minor muscle
Superficial layer of deep cervical fascia
Zygomaticus major muscle
Orbicularis oris muscle
Mentalis muscle
Modiolus (*circled region*)
Depressor labii inferioris muscle
Depressor anguli oris muscle
Buccinator muscle
Risorius muscle
Platysma muscle
Sternum
Clavicle
F. Netter M.D.

Plate 32 Muscles of Neck: Anterior View

See also **Plates 33** (s0165) , **35** (s0175) , **38** (s0190)

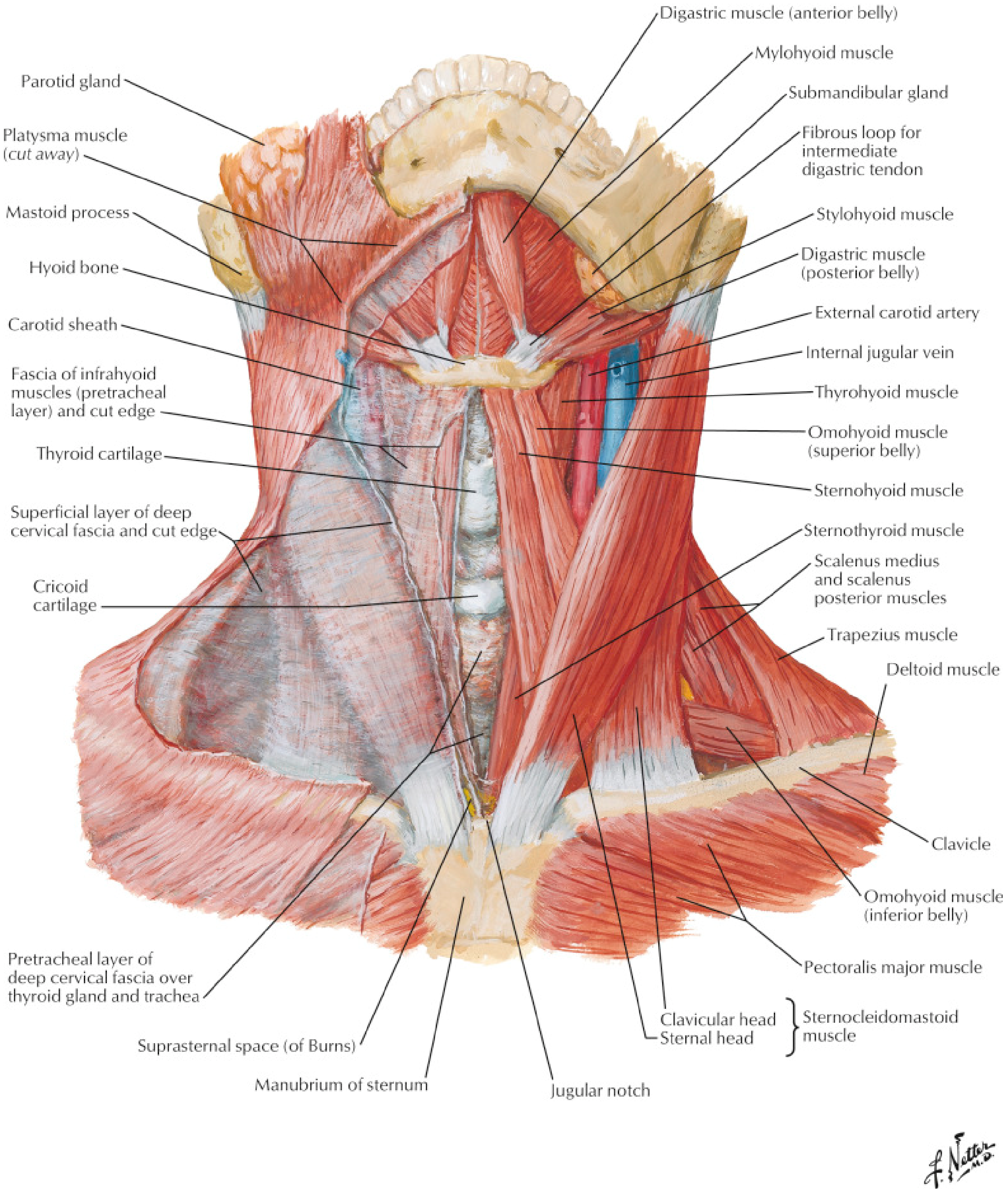

Digastric muscle (anterior belly)
Mylohyoid muscle
Submandibular gland
Fibrous loop for intermediate digastric tendon
Stylohyoid muscle
Digastric muscle (posterior belly)
External carotid artery
Internal jugular vein
Thyrohyoid muscle
Omohyoid muscle (superior belly)
Sternohyoid muscle
Sternothyroid muscle
Scalenus medius and scalenus posterior muscles
Trapezius muscle
Deltoid muscle
Clavicle
Omohyoid muscle (inferior belly)
Pectoralis major muscle
Clavicular head
Sternal head
Sternocleidomastoid muscle
Jugular notch
Manubrium of sternum
Suprasternal space (of Burns)
Pretracheal layer of deep cervical fascia over thyroid gland and trachea
Cricoid cartilage
Superficial layer of deep cervical fascia and cut edge
Thyroid cartilage
Fascia of infrahyoid muscles (pretracheal layer) and cut edge
Carotid sheath
Hyoid bone
Mastoid process
Platysma muscle (*cut away*)
Parotid gland

Plate 33 Fascial Layers of Neck

See also **Plate 32** (s0160)

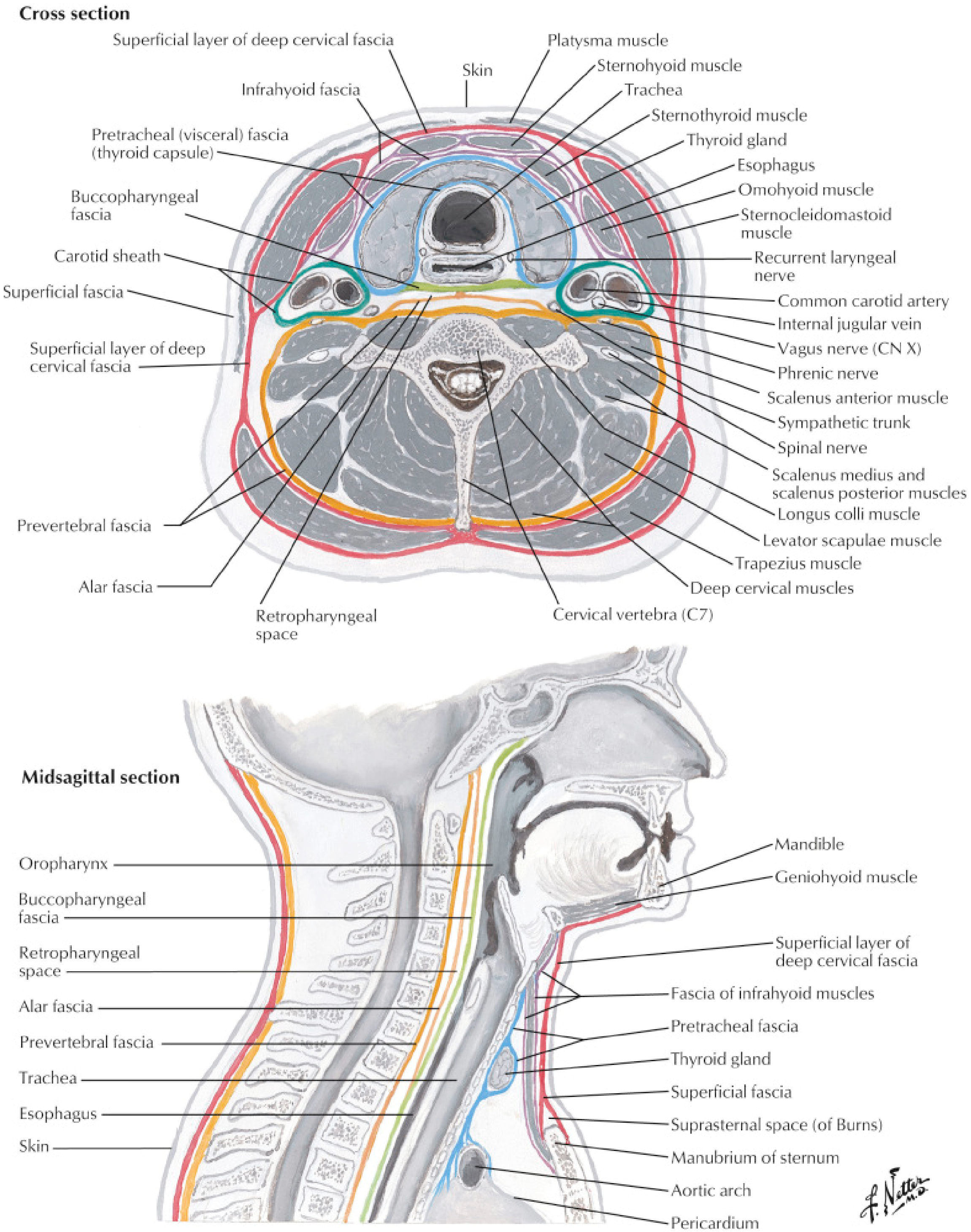
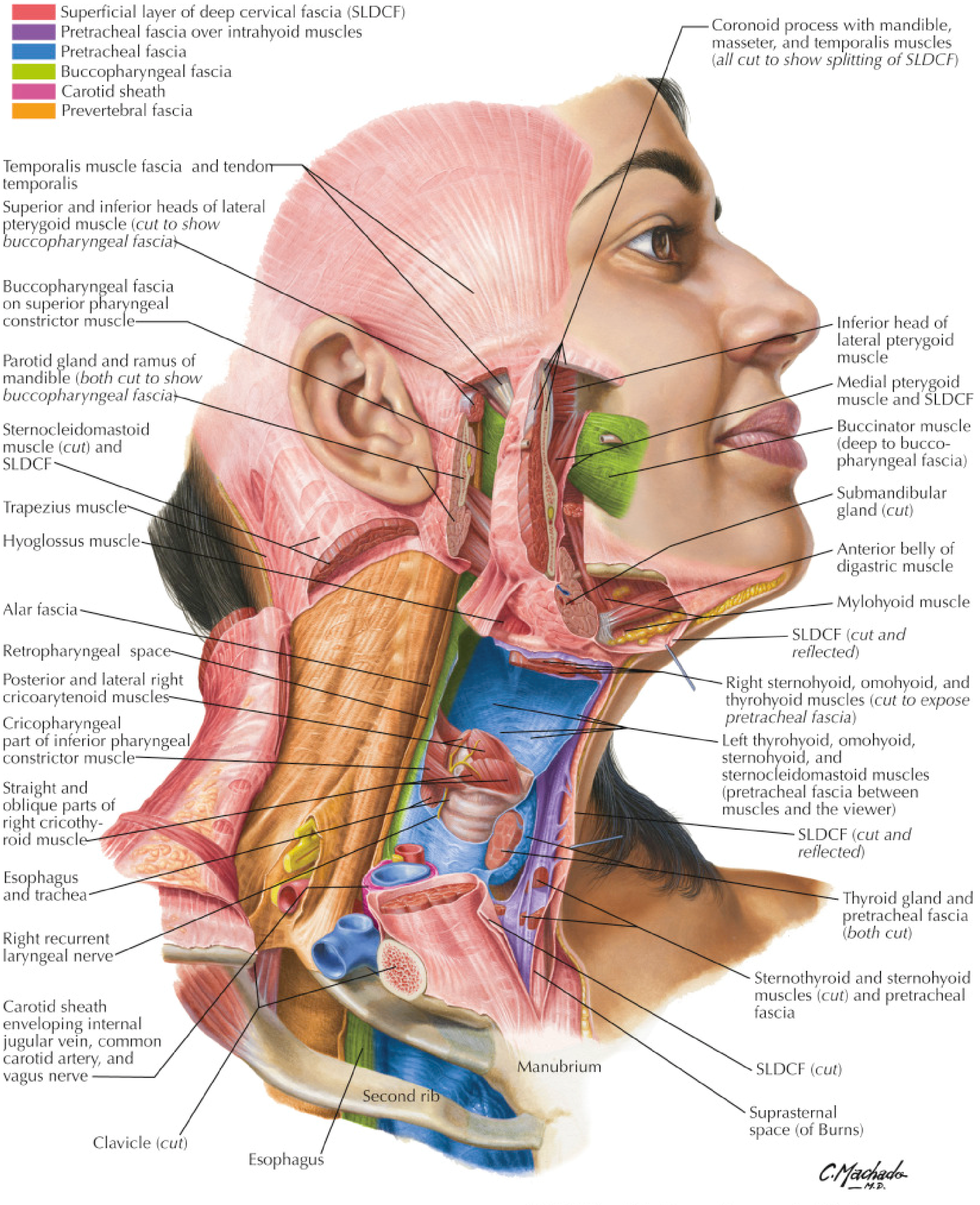

Cross section
Superficial layer of deep cervical fascia
Skin
Platysma muscle
Sternohyoid muscle
Infrahyoid fascia
Trachea
Sternothyroid muscle
Pretracheal (visceral) fascia (thyroid capsule)
Thyroid gland
Esophagus
Omohyoid muscle
Buccopharyngeal fascia
Sternocleidomastoid muscle
Carotid sheath
Recurrent laryngeal nerve
Superficial fascia
Common carotid artery
Internal jugular vein
Vagus nerve (CN X)
Superficial layer of deep cervical fascia
Phrenic nerve
Scalenus anterior muscle
Sympathetic trunk
Spinal nerve
Scalenus medius and scalenus posterior muscles
Prevertebral fascia
Longus colli muscle
Levator scapulae muscle
Trapezius muscle
Alar fascia
Deep cervical muscles
Retropharyngeal space
Cervical vertebra (C7)
Midsagittal section
Mandible
Geniohyoid muscle
Oropharynx
Buccopharyngeal fascia
Superficial layer of deep cervical fascia
Retropharyngeal space
Fascia of infrahyoid muscles
Alar fascia
Pretracheal fascia
Prevertebral fascia
Thyroid gland
Trachea
Superficial fascia
Esophagus
Suprasternal space (of Burns)
Skin
Manubrium of sternum
Aortic arch
Pericardium

Plate 34 Cervical Fasciae

See also **Plates 32** (s0160) , **33** (s0165) , **38** (s0190)


Superficial layer of deep cervical fascia (SLDCF)
Pretracheal fascia over intrahyoid muscles
Pretracheal fascia
Buccopharyngeal fascia
Carotid sheath
Prevertebral fascia
Temporalis muscle fascia and tendon temporalis
Superior and inferior heads of lateral pterygoid muscle (*cut to show buccopharyngeal fascia*)
Buccopharyngeal fascia on superior pharyngeal constrictor muscle
Parotid gland and ramus of mandible (*both cut to show buccopharyngeal fascia*)
Sternocleidomastoid muscle (*cut*) and SLDCF
Trapezius muscle
Hyoglossus muscle
Alar fascia
Retropharyngeal space
Posterior and lateral right cricoarytenoid muscles
Cricopharyngeal part of inferior pharyngeal constrictor muscle
Straight and oblique parts of right cricothyroid muscle
Esophagus and trachea
Right recurrent laryngeal nerve
Carotid sheath enveloping internal jugular vein, common carotid artery, and vagus nerve
Clavicle (*cut*)
Esophagus
Second rib
Manubrium
Coronoid process with mandible, masseter, and temporalis muscles (*all cut to show splitting of SLDCF*)
Inferior head of lateral pterygoid muscle
Medial pterygoid muscle and SLDCF
Buccinator muscle (deep to buccopharyngeal fascia)
Submandibular gland (*cut*)
Anterior belly of digastric muscle
Mylohyoid muscle
SLDCF (*cut and reflected*)
Right sternohyoid, omohyoid, and thyrohyoid muscles (*cut to expose pretracheal fascia*)
Left thyrohyoid, omohyoid, sternohyoid, and sternocleidomastoid muscles (pretracheal fascia between muscles and the viewer)
SLDCF (*cut and reflected*)
Thyroid gland and pretracheal fascia (*both cut*)
Sternothyroid and sternohyoid muscles (*cut*) and pretracheal fascia
SLDCF (*cut*)
Suprasternal space (of Burns)
C. Machado M.D.

SLDCF: Superficial layer of deep cervical fascia

Plate 35 Infrahyoid and Suprahyoid Muscles

See also **Plates 32** (s0160) , **36** (s0180) , **69** (s0355)

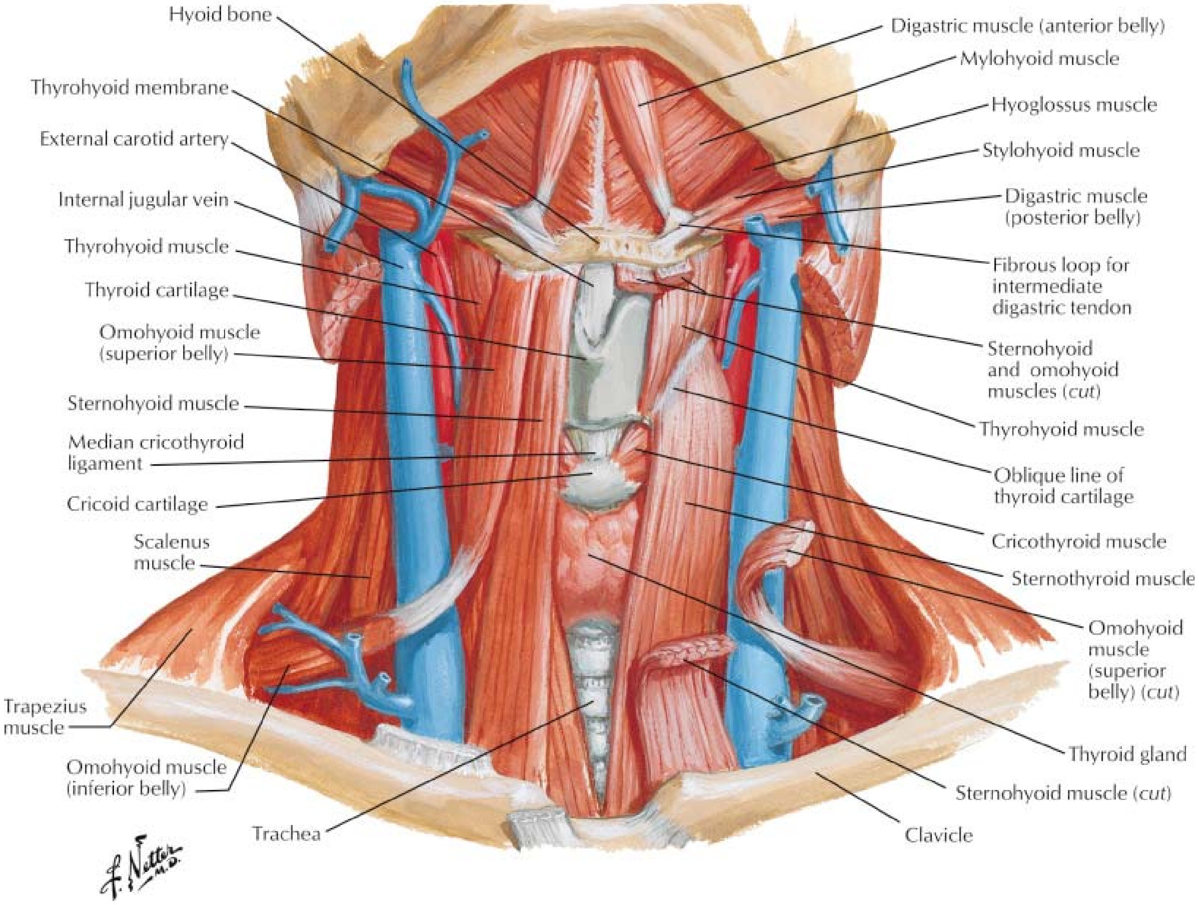

Hyoid bone
Thyrohyoid membrane
External carotid artery
Internal jugular vein
Thyrohyoid muscle
Thyroid cartilage
Omohyoid muscle (superior belly)
Sternohyoid muscle
Median cricothyroid ligament
Cricoid cartilage
Scalenus muscle
Trapezius muscle
Omohyoid muscle (inferior belly)
Trachea
Digastric muscle (anterior belly)
Mylohyoid muscle
Hyoglossus muscle
Stylohyoid muscle
Digastric muscle (posterior belly)
Fibrous loop for intermediate digastric tendon
Sternohyoid and omohyoid muscles (*cut*)
Thyrohyoid muscle
Oblique line of thyroid cartilage
Cricothyroid muscle
Sternothyroid muscle
Omohyoid muscle (superior belly) (*cut*)
Thyroid gland
Sternohyoid muscle (*cut*)
Clavicle
F. Netter M.D.

Plate 36 Muscles of Neck: Lateral View

See also **Plates 32** (s0160) , **35** (s0175) , **38** (s0190)

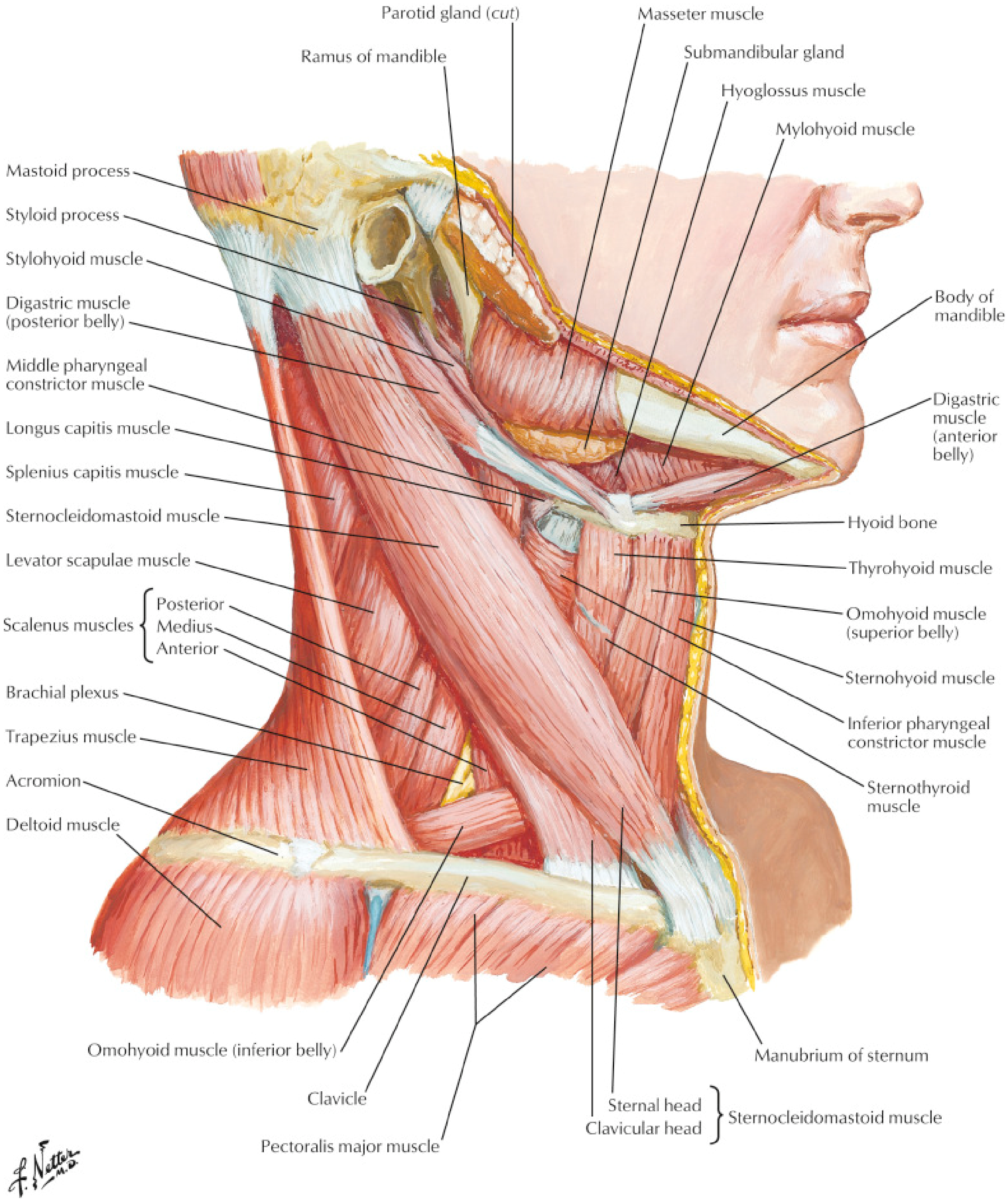

Parotid gland (cut)
Masseter muscle
Ramus of mandible
Submandibular gland
Hyoglossus muscle
Mylohyoid muscle
Mastoid process
Styloid process
Stylohyoid muscle
Digastric muscle (posterior belly)
Middle pharyngeal constrictor muscle
Longus capitis muscle
Splenius capitis muscle
Sternocleidomastoid muscle
Levator scapulae muscle
Scalenus muscles
Posterior
Medius
Anterior
Brachial plexus
Trapezius muscle
Acromion
Deltoid muscle
Body of mandible
Digastric muscle (anterior belly)
Hyoid bone
Thyrohyoid muscle
Omohyoid muscle (superior belly)
Sternohyoid muscle
Inferior pharyngeal constrictor muscle
Sternothyroid muscle
Omohyoid muscle (inferior belly)
Clavicle
Pectoralis major muscle
Manubrium of sternum
Sternal head
Clavicular head
Sternocleidomastoid muscle
F. Netter M.D.

Plate 37 Anterior and Lateral Cervical Muscles

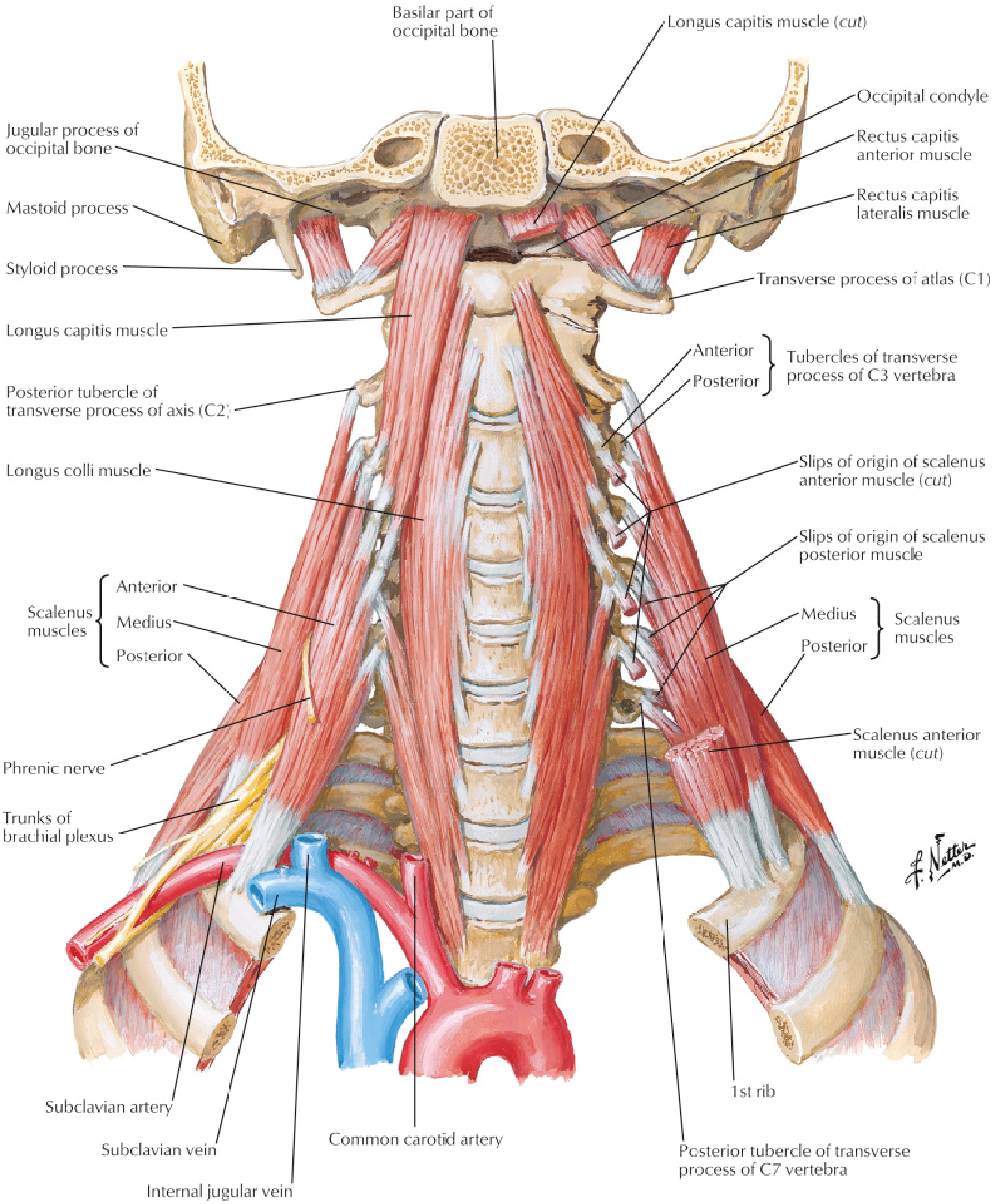

Basilar part of occipital bone
Longus capitis muscle (*cut*)
Occipital condyle
Rectus capitis anterior muscle
Rectus capitis lateralis muscle
Jugular process of occipital bone
Mastoid process
Styloid process
Transverse process of atlas (C1)
Longus capitis muscle
Anterior
Posterior
Tubercles of transverse process of C3 vertebra
Posterior tubercle of transverse process of axis (C2)
Longus colli muscle
Slips of origin of scalenus anterior muscle (*cut*)
Slips of origin of scalenus posterior muscle
Scalenus muscles
Anterior
Medius
Posterior
Medius
Posterior
Scalenus muscles
Phrenic nerve
Scalenus anterior muscle (*cut*)
Trunks of brachial plexus
F. Netter M.D.
Subclavian artery
Subclavian vein
Internal jugular vein
Common carotid artery
1st rib
Posterior tubercle of transverse process of C7 vertebra

Plate 38 Superficial Veins and Cutaneous Nerves of Neck

For deep veins of neck see **Plate 84** (s0435)

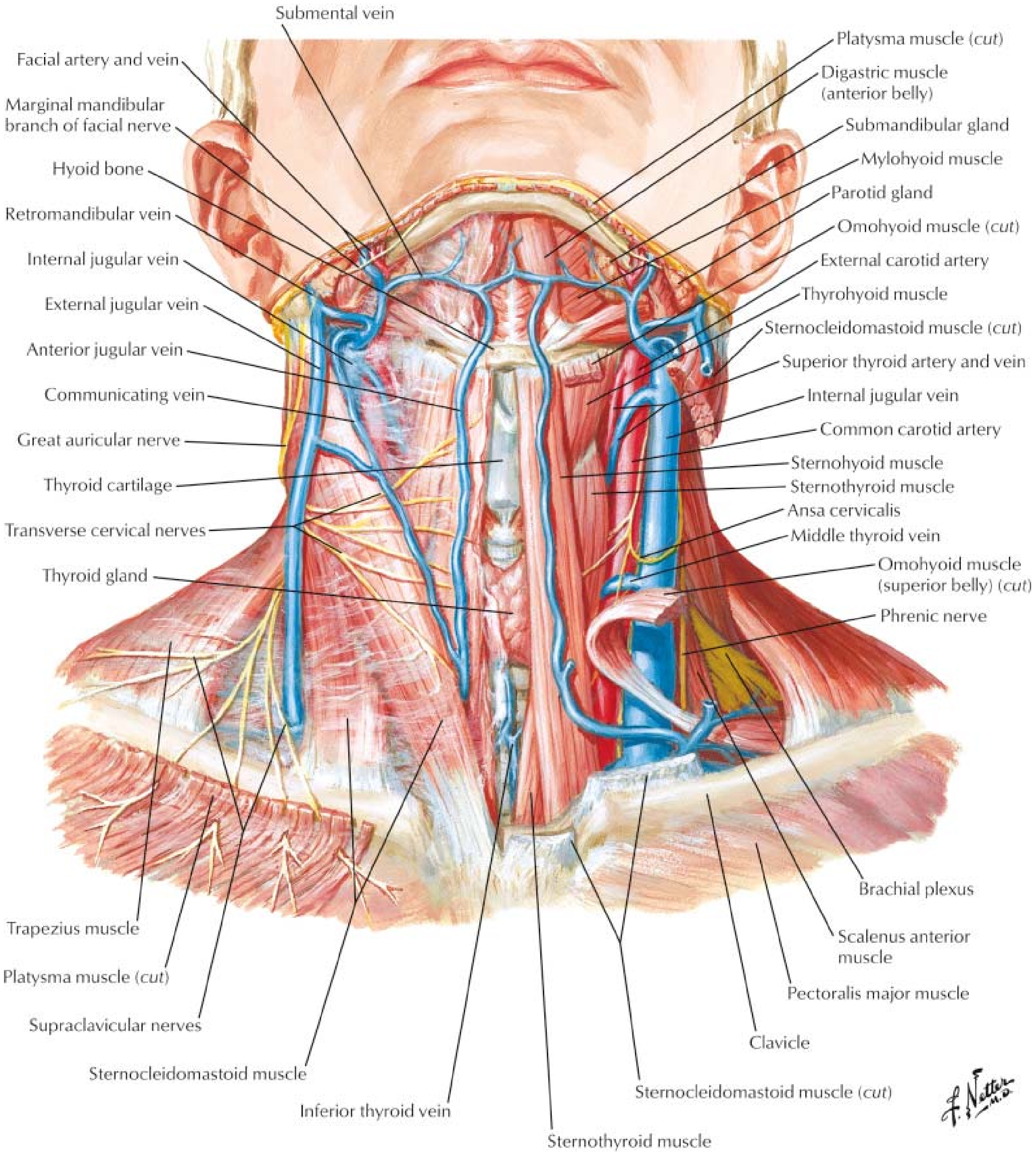

Submental vein
Facial artery and vein
Marginal mandibular branch of facial nerve
Hyoid bone
Retromandibular vein
Internal jugular vein
External jugular vein
Anterior jugular vein
Communicating vein
Great auricular nerve
Thyroid cartilage
Transverse cervical nerves
Thyroid gland
Platysma muscle (*cut*)
Digastric muscle (anterior belly)
Submandibular gland
Mylohyoid muscle
Parotid gland
Omohyoid muscle (*cut*)
External carotid artery
Thyrohyoid muscle
Sternocleidomastoid muscle (*cut*)
Superior thyroid artery and vein
Internal jugular vein
Common carotid artery
Sternohyoid muscle
Sternothyroid muscle
Ansa cervicalis
Middle thyroid vein
Omohyoid muscle (superior belly) (*cut*)
Phrenic nerve
Brachial plexus
Scalenus anterior muscle
Pectoralis major muscle
Clavicle
Sternocleidomastoid muscle (*cut*)
Sternothyroid muscle
Inferior thyroid vein
Sternocleidomastoid muscle
Supraclavicular nerves
Platysma muscle (*cut*)
Trapezius muscle
F. Netter M.D.

Plate 39 Nerves and Vessels of Neck

See also **Plates 138** (s0730) , **139** (s0735) , **140** (s0740)

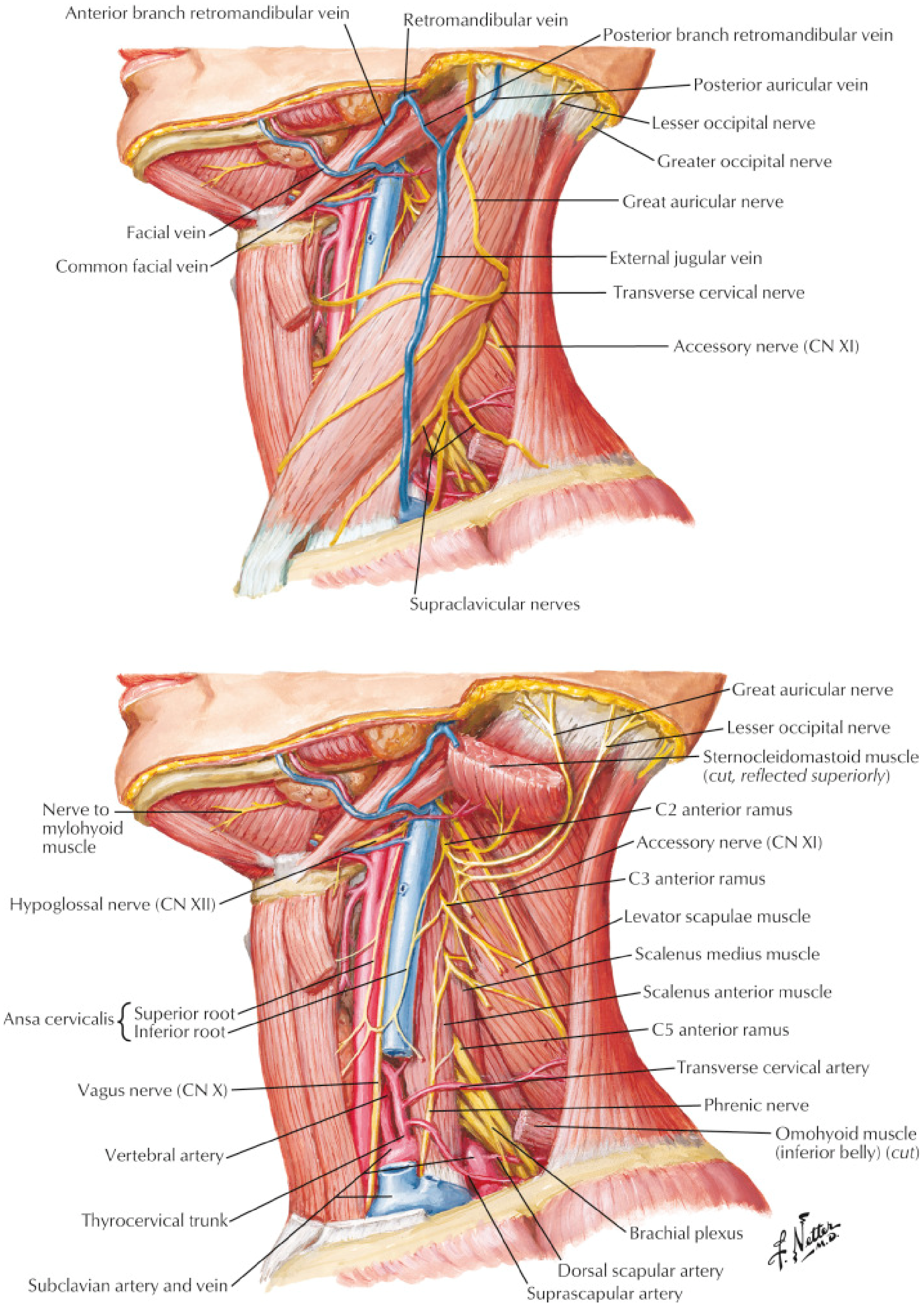
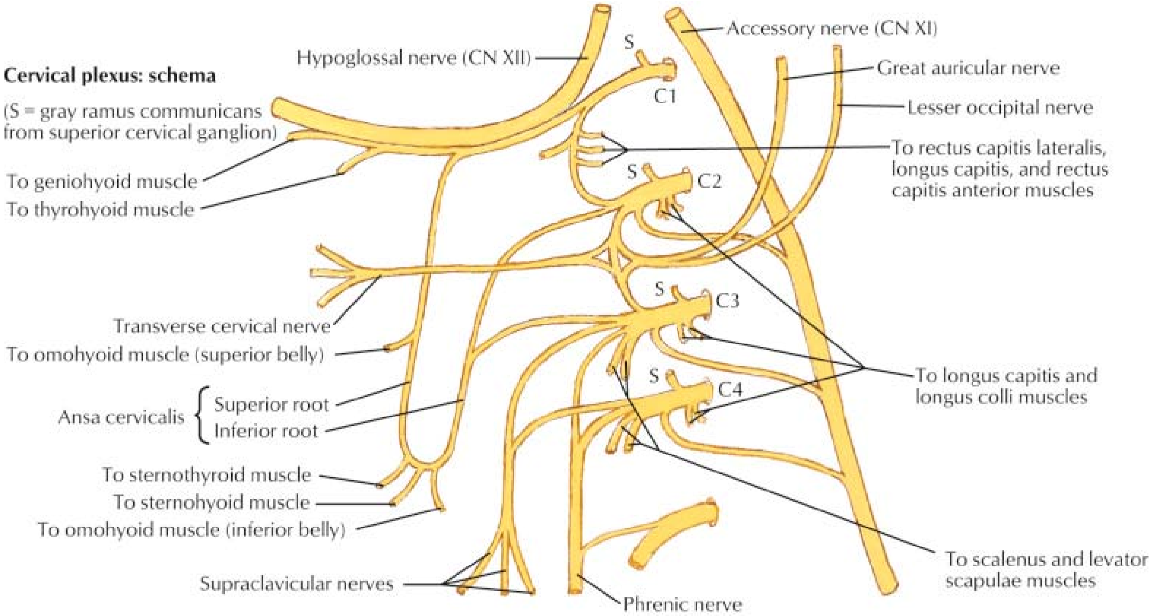

Anterior branch retromandibular vein
Retromandibular vein
Posterior branch retromandibular vein
Posterior auricular vein
Lesser occipital nerve
Greater occipital nerve
Great auricular nerve
Facial vein
Common facial vein
External jugular vein
Transverse cervical nerve
Accessory nerve (CN XI)
Supraclavicular nerves
Great auricular nerve
Lesser occipital nerve
Sternocleidomastoid muscle
(cut, reflected superiorly)
Nerve to mylohyoid muscle
C2 anterior ramus
Accessory nerve (CN XI)
C3 anterior ramus
Hypoglossal nerve (CN XII)
Levator scapulae muscle
Scalenus medius muscle
Scalenus anterior muscle
Ansa cervicalis
Superior root
Inferior root
C5 anterior ramus
Transverse cervical artery
Vagus nerve (CN X)
Phrenic nerve
Omohyoid muscle
(inferior belly) (cut)
Vertebral artery
Thyrocervical trunk
Brachial plexus
Dorsal scapular artery
Suprascapular artery
Subclavian artery and vein
F. Netter M.D.

Plate 40 Nerves and Vessels of Neck (continued)

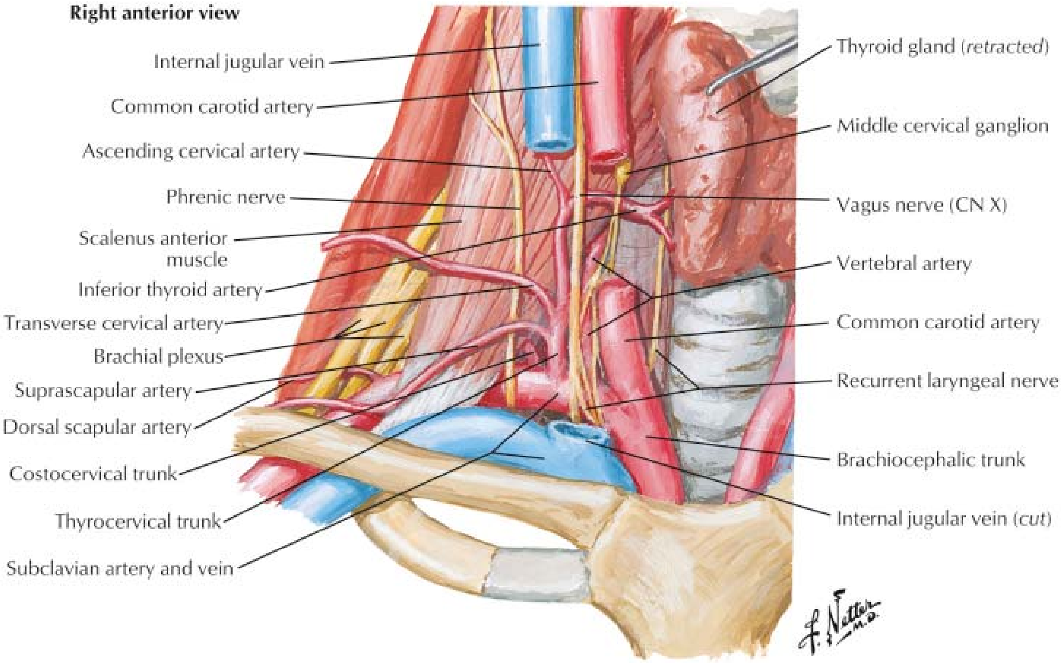
See also **Plate 140** (s0740)



Cervical plexus: schema

(S = gray ramus communicans from superior cervical ganglion)

Hypoglossal nerve (CN XII)
S
C1
Accessory nerve (CN XI)
Great auricular nerve
Lesser occipital nerve
To rectus capitis lateralis, longus capitis, and rectus capitis anterior muscles
To geniohyoid muscle
To thyrohyoid muscle
S
C2
S
C3
Transverse cervical nerve
To omohyoid muscle (superior belly)
To longus capitis and longus colli muscles
S
C4
Ansa cervicalis
Superior root
Inferior root
To sternothyroid muscle
To sternohyoid muscle
To omohyoid muscle (inferior belly)
To scalenus and levator scapulae muscles
Supraclavicular nerves
Phrenic nerve

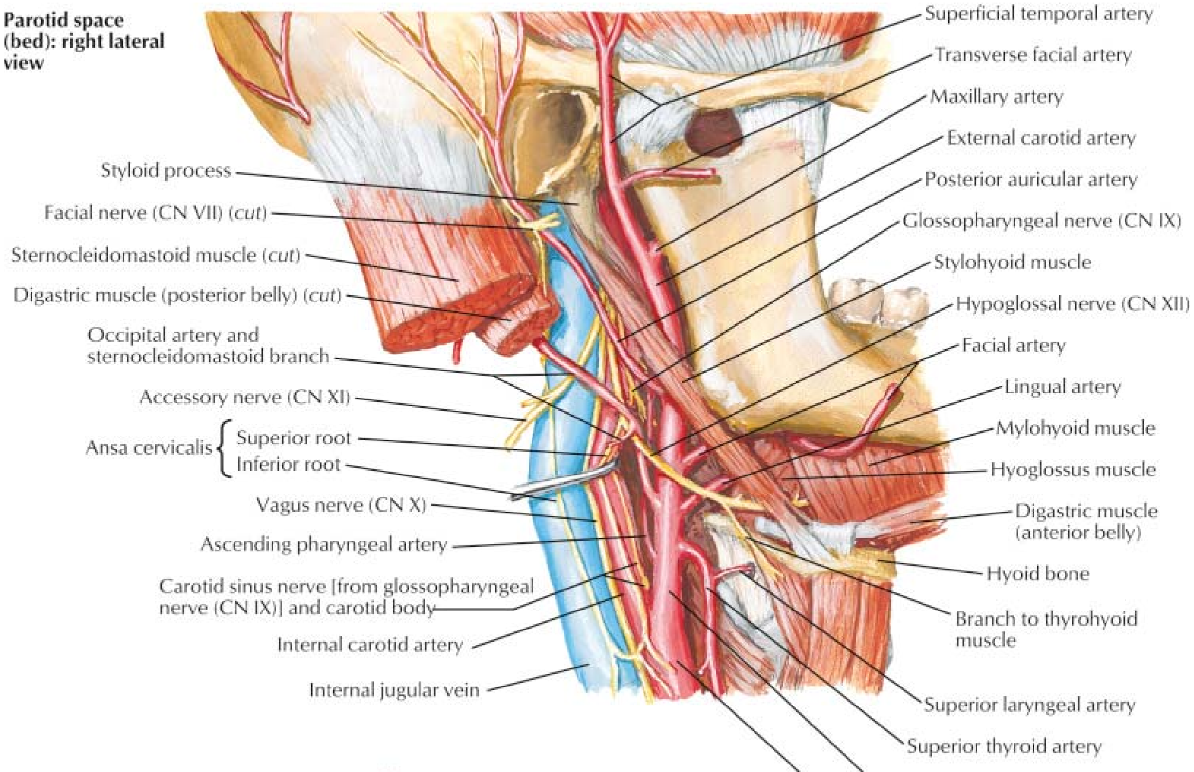


Right anterior view

Internal jugular vein
Common carotid artery
Ascending cervical artery
Phrenic nerve
Scalenus anterior muscle
Inferior thyroid artery
Transverse cervical artery
Brachial plexus
Suprascapular artery
Dorsal scapular artery
Costocervical trunk
Thyrocervical trunk
Subclavian artery and vein
Thyroid gland (retracted)
Middle cervical ganglion
Vagus nerve (CN X)
Vertebral artery
Common carotid artery
Recurrent laryngeal nerve
Brachiocephalic trunk
Internal jugular vein (cut)
F. Netter M.D.

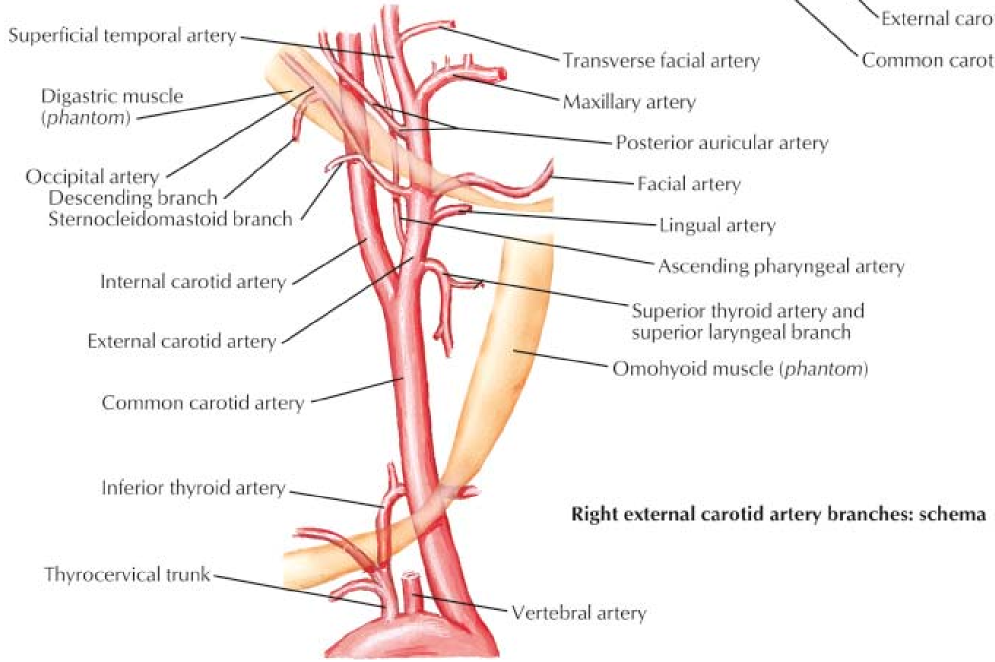
Plate 41 Carotid Arteries

See also **Plates 147** (s0780) **,** 149 (s0790)



Parotid space (bed): right lateral view

Superficial temporal artery
Transverse facial artery
Maxillary artery
External carotid artery
Posterior auricular artery
Glossopharyngeal nerve (CN IX)
Stylohyoid muscle
Hypoglossal nerve (CN XII)
Facial artery
Lingual artery
Mylohyoid muscle
Hyoglossus muscle
Digastric muscle (anterior belly)
Hyoid bone
Branch to thyrohyoid muscle
Superior laryngeal artery
Superior thyroid artery
External carotid artery
Common carotid artery
Styloid process
Facial nerve (CN VII) (cut)
Sternocleidomastoid muscle (cut)
Digastric muscle (posterior belly) (cut)
Occipital artery and sternocleidomastoid branch
Accessory nerve (CN XI)
Ansa cervicalis
Superior root
Inferior root
Vagus nerve (CN X)
Ascending pharyngeal artery
Carotid sinus nerve [from glossopharyngeal nerve (CN IX)] and carotid body
Internal carotid artery
Internal jugular vein



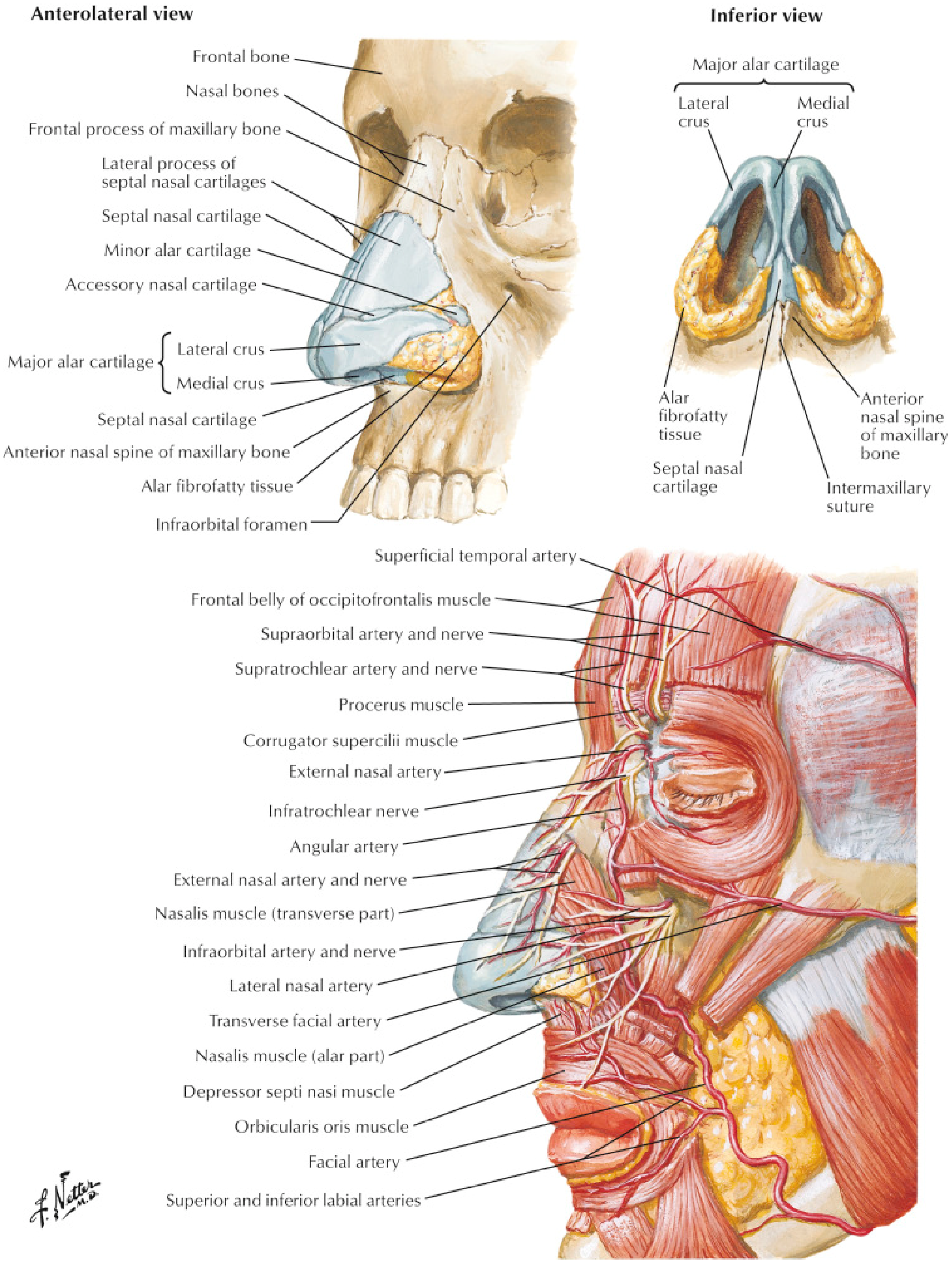
Right external carotid artery branches: schema

Superficial temporal artery
Digastric muscle (phantom)
Occipital artery
Descending branch
Sternocleidomastoid branch
Internal carotid artery
External carotid artery
Common carotid artery
Inferior thyroid artery
Thyrocervical trunk
Transverse facial artery
Maxillary artery
Posterior auricular artery
Facial artery
Lingual artery
Ascending pharyngeal artery
Superior thyroid artery and superior laryngeal branch
Omohyoid muscle (phantom)
Vertebral artery
F. Netter M.D.

Nasal Region

Plate 42 Nose

See also **Plate 45** (s0230)

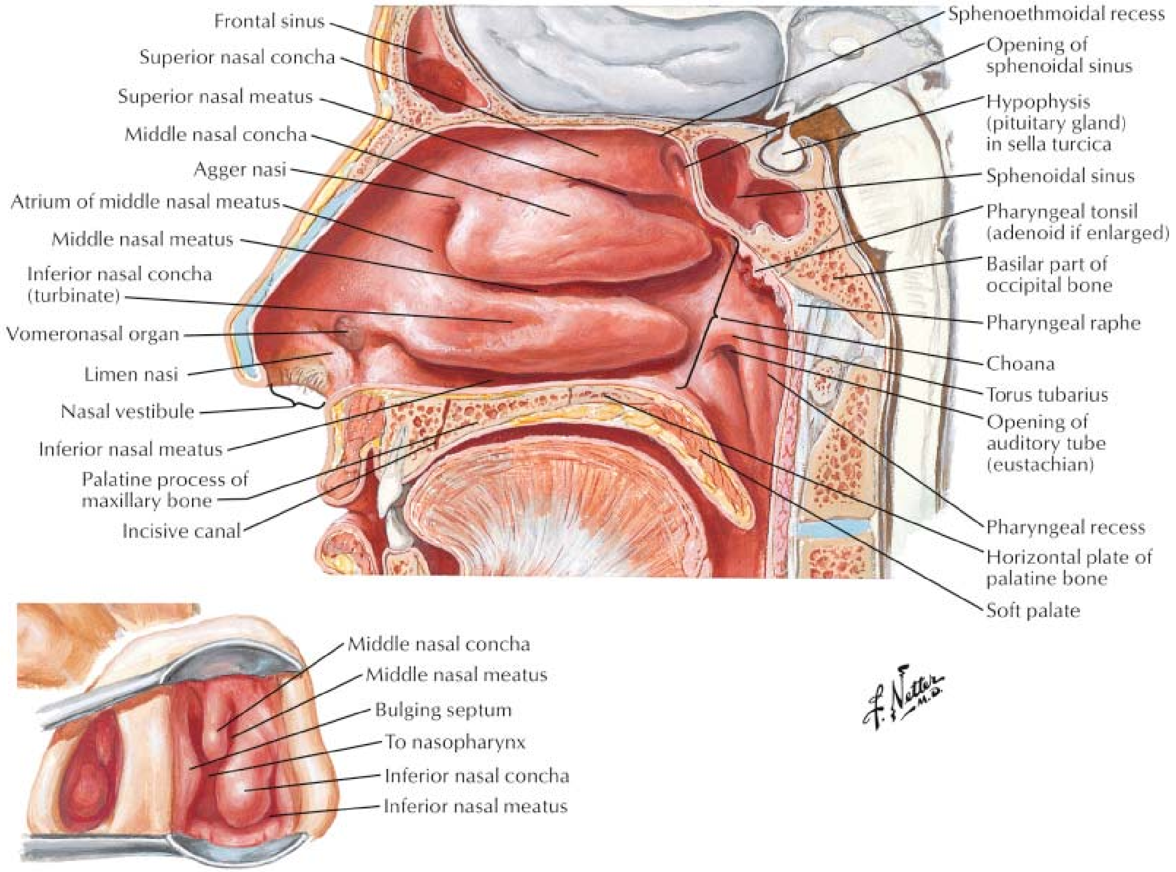


Anterolateral view

Inferior view

Frontal bone
Nasal bones
Frontal process of maxillary bone
Lateral process of septal nasal cartilages
Septal nasal cartilage
Minor alar cartilage
Accessory nasal cartilage
Major alar cartilage
Lateral crus
Medial crus
Septal nasal cartilage
Anterior nasal spine of maxillary bone
Alar fibrofatty tissue
Infraorbital foramen
Major alar cartilage
Lateral crus
Medial crus
Alar fibrofatty tissue
Septal nasal cartilage
Anterior nasal spine of maxillary bone
Intermaxillary suture
Superficial temporal artery
Frontal belly of occipitofrontalis muscle
Supraorbital artery and nerve
Supratrochlear artery and nerve
Procerus muscle
Corrugator supercilii muscle
External nasal artery
Infratrochlear nerve
Angular artery
External nasal artery and nerve
Nasalis muscle (transverse part)
Infraorbital artery and nerve
Lateral nasal artery
Transverse facial artery
Nasalis muscle (alar part)
Depressor septi nasi muscle
Orbicularis oris muscle
Facial artery
Superior and inferior labial arteries
F. Netter M.D.

Plate 43 Lateral Wall of Nasal Cavity


Frontal sinus
Superior nasal concha
Superior nasal meatus
Middle nasal concha
Agger nasi
Atrium of middle nasal meatus
Middle nasal meatus
Inferior nasal concha (turbinate)
Vomeronasal organ
Limen nasi
Nasal vestibule
Inferior nasal meatus
Palatine process of maxillary bone
Incisive canal
Sphenoethmoidal recess
Opening of sphenoidal sinus
Hypophysis (pituitary gland) in sella turcica
Sphenoidal sinus
Pharyngeal tonsil (adenoid if enlarged)
Basilar part of occipital bone
Pharyngeal raphe
Choana
Torus tubarius
Opening of auditory tube (eustachian)
Pharyngeal recess
Horizontal plate of palatine bone
Soft palate
Middle nasal concha
Middle nasal meatus
Bulging septum
To nasopharynx
Inferior nasal concha
Inferior nasal meatus

Inferior view with speculum in place

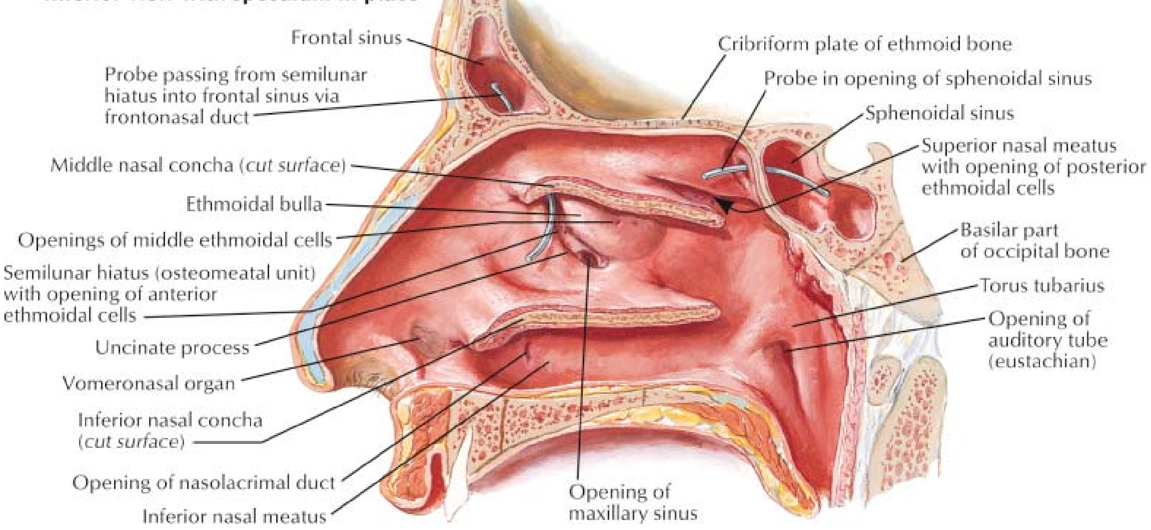

Frontal sinus
Probe passing from semilunar hiatus into frontal sinus via frontonasal duct
Middle nasal concha (*cut surface*)
Ethmoidal bulla
Openings of middle ethmoidal cells
Semilunar hiatus (osteomeatal unit) with opening of anterior ethmoidal cells
Uncinate process
Vomeronasal organ
Inferior nasal concha (*cut surface*)
Opening of nasolacrimal duct
Inferior nasal meatus
Opening of maxillary sinus
Cribriform plate of ethmoid bone
Probe in opening of sphenoidal sinus
Sphenoidal sinus
Superior nasal meatus with opening of posterior ethmoidal cells
Basilar part of occipital bone
Torus tubarius
Opening of auditory tube (eustachian)

Plate 44 Lateral Wall of Nasal Cavity (continued)

See also **Plates 43** (s0220) , **45** (s0230)

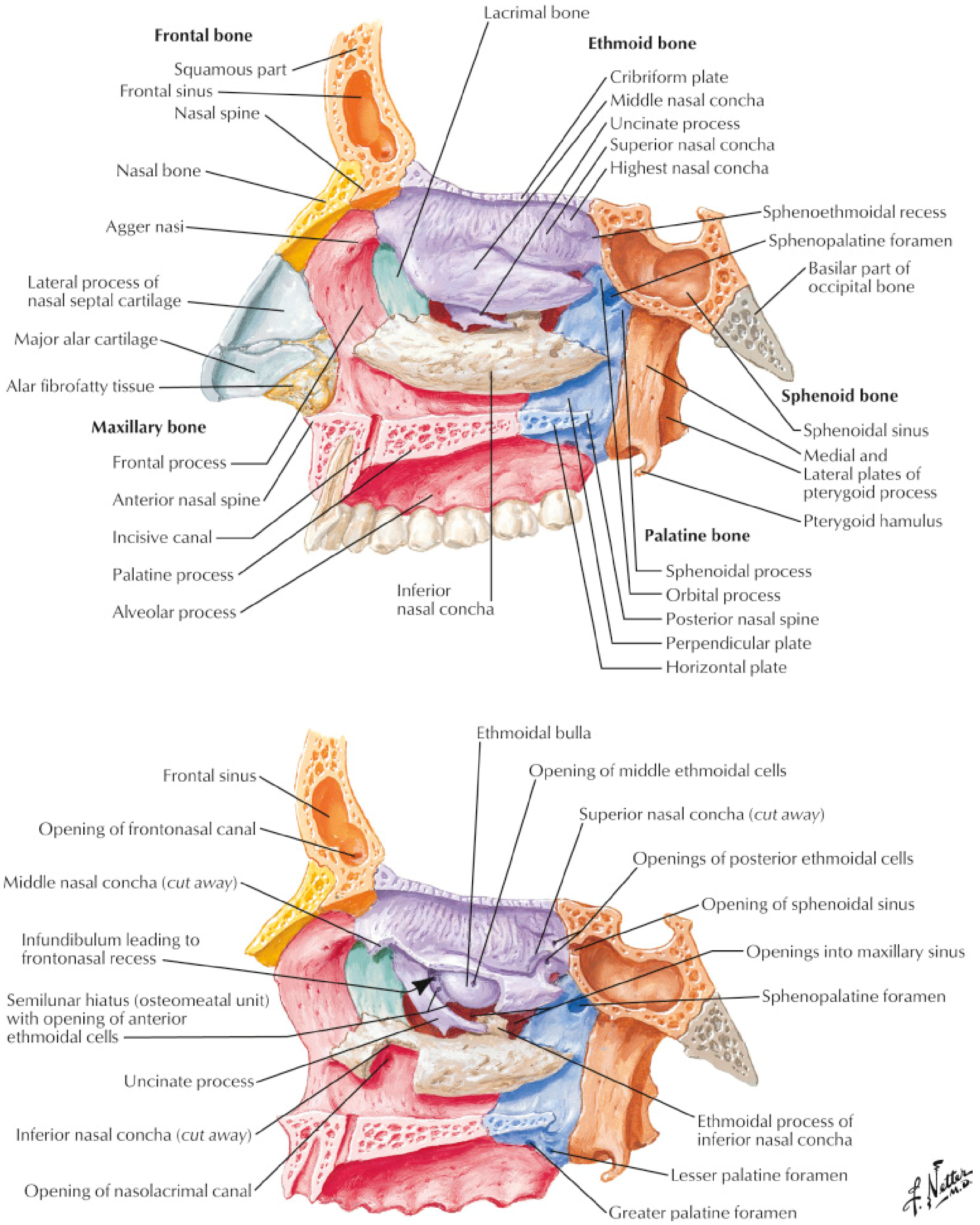
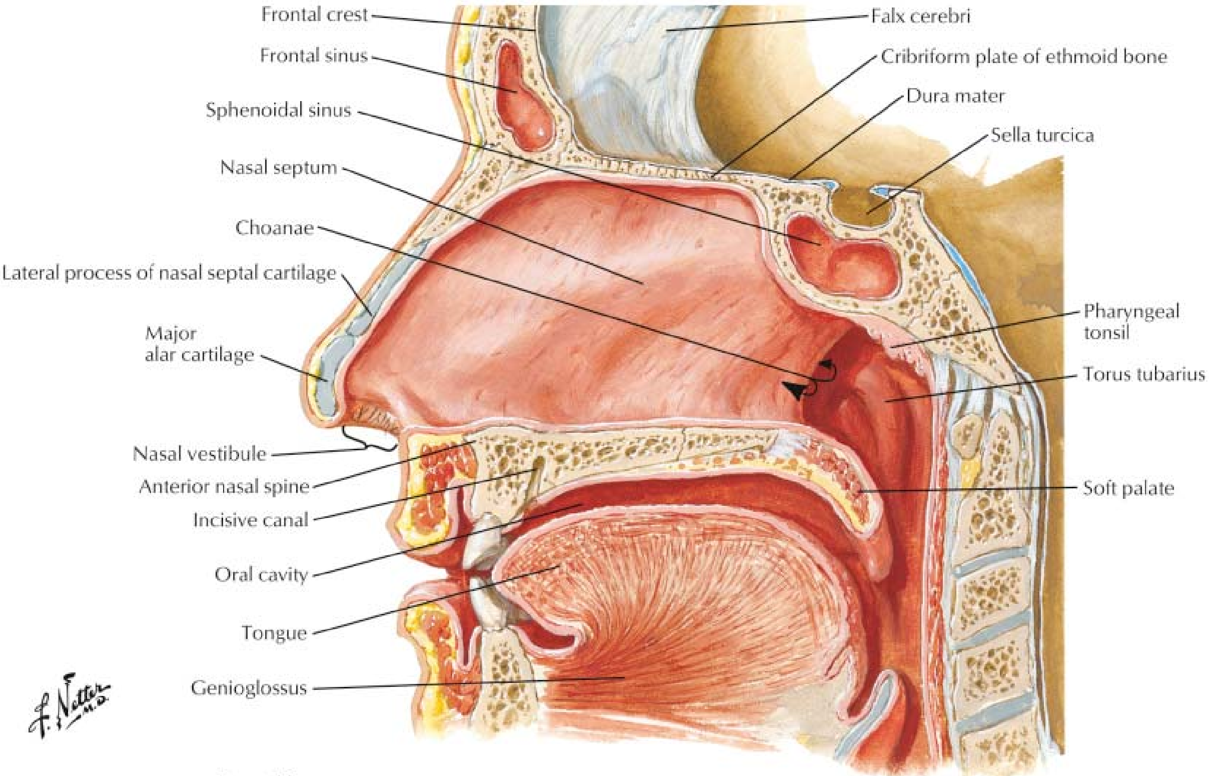

Lacrimal bone
Frontal bone
Squamous part
Frontal sinus
Nasal spine
Ethmoid bone
Cribriform plate
Middle nasal concha
Uncinate process
Superior nasal concha
Highest nasal concha
Nasal bone
Agger nasi
Sphenoethmoidal recess
Sphenopalatine foramen
Basilar part of occipital bone
Lateral process of nasal septal cartilage
Major alar cartilage
Alar fibrofatty tissue
Sphenoid bone
Maxillary bone
Sphenoidal sinus
Frontal process
Medial and Lateral plates of pterygoid process
Anterior nasal spine
Pterygoid hamulus
Incisive canal
Palatine bone
Palatine process
Sphenoidal process
Orbital process
Alveolar process
Inferior nasal concha
Posterior nasal spine
Perpendicular plate
Horizontal plate
Ethmoidal bulla
Opening of middle ethmoidal cells
Frontal sinus
Superior nasal concha (*cut away*)
Opening of frontonasal canal
Openings of posterior ethmoidal cells
Middle nasal concha (*cut away*)
Opening of sphenoidal sinus
Infundibulum leading to frontonasal recess
Openings into maxillary sinus
Sphenopalatine foramen
Semilunar hiatus (osteomeatal unit) with opening of anterior ethmoidal cells
Uncinate process
Ethmoidal process of inferior nasal concha
Inferior nasal concha (*cut away*)
Lesser palatine foramen
Opening of nasolacrimal canal
Greater palatine foramen
F. Netter M.D.

Plate 45 Medial Wall of Nasal Cavity (Nasal Septum)

See also **Plate 15** (s0070)


Frontal crest
Frontal sinus
Sphenoidal sinus
Nasal septum
Choanae
Lateral process of nasal septal cartilage
Major alar cartilage
Nasal vestibule
Anterior nasal spine
Incisive canal
Oral cavity
Tongue
Genioglossus
Falx cerebri
Cribriform plate of ethmoid bone
Dura mater
Sella turcica
Pharyngeal tonsil
Torus tubarius
Soft palate
F. Netter M.D.

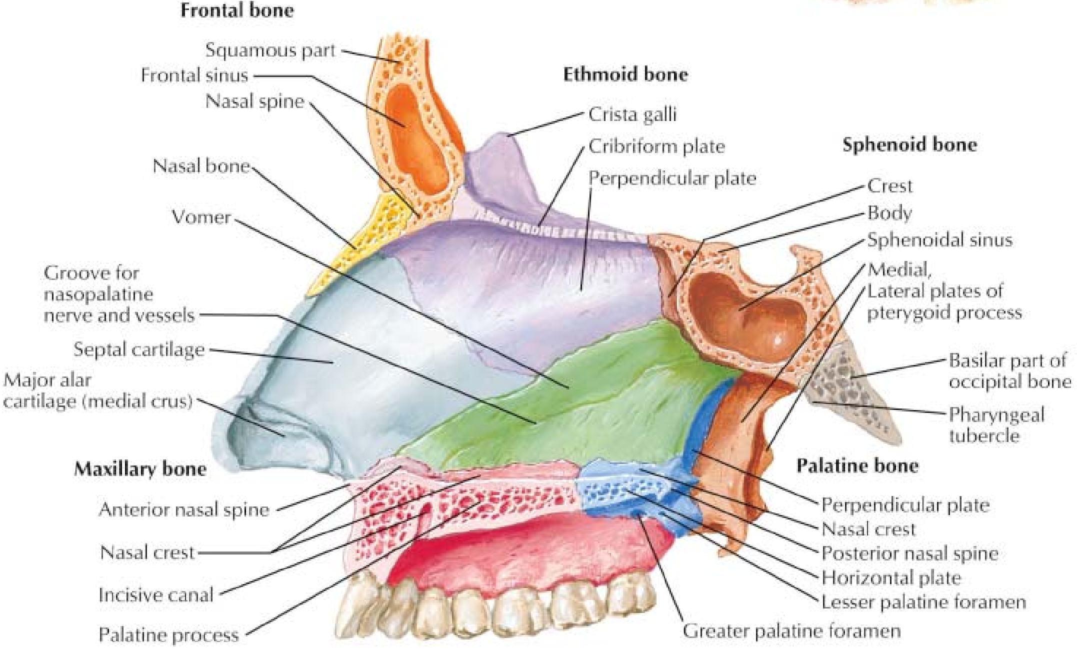
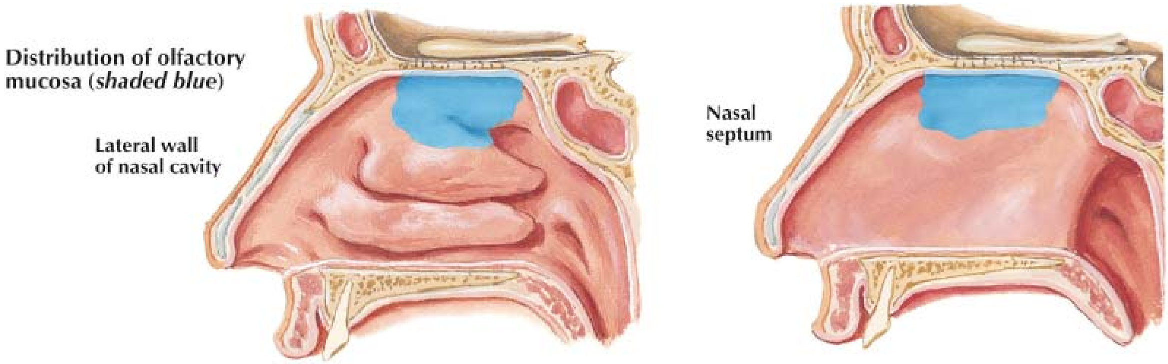

Frontal bone
Squamous part
Frontal sinus
Nasal spine
Nasal bone
Vomer
Groove for nasopalatine nerve and vessels
Septal cartilage
Major alar cartilage (medial crus)
Maxillary bone
Anterior nasal spine
Nasal crest
Incisive canal
Palatine process
Ethmoid bone
Crista galli
Cribriform plate
Perpendicular plate
Sphenoid bone
Crest
Body
Sphenoidal sinus
Medial,
Lateral plates of pterygoid process
Basilar part of occipital bone
Pharyngeal tubercle
Palatine bone
Perpendicular plate
Nasal crest
Posterior nasal spine
Horizontal plate
Lesser palatine foramen
Greater palatine foramen

Plate 46 Nerves of Nasal Cavity

See also **Plates 63** (s0320) **, 73** (s0375) **, 130** (s0690)


Distribution of olfactory mucosa (*shaded blue*)
Lateral wall of nasal cavity
Nasal septum

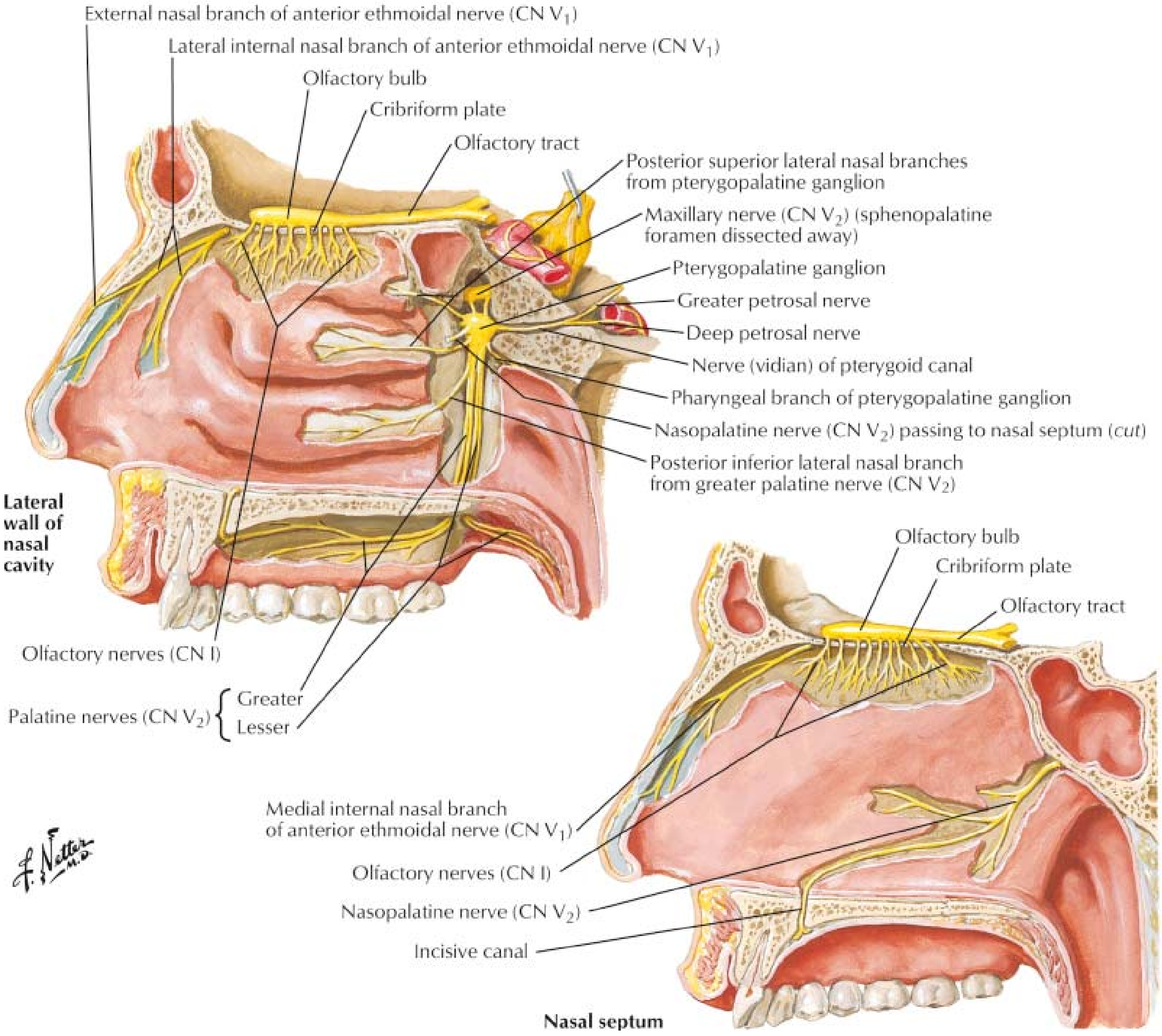

External nasal branch of anterior ethmoidal nerve (CN V1)
Lateral internal nasal branch of anterior ethmoidal nerve (CN V1)
Olfactory bulb
Cribriform plate
Olfactory tract
Posterior superior lateral nasal branches from pterygopalatine ganglion
Maxillary nerve (CN V2) (sphenopalatine foramen dissected away)
Pterygopalatine ganglion
Greater petrosal nerve
Deep petrosal nerve
Nerve (vidian) of pterygoid canal
Pharyngeal branch of pterygopalatine ganglion
Nasopalatine nerve (CN V2) passing to nasal septum (*cut*)
Posterior inferior lateral nasal branch from greater palatine nerve (CN V2)
Lateral wall of nasal cavity
Olfactory nerves (CN I)
Palatine nerves (CN V2)
Greater
Lesser
Olfactory bulb
Cribriform plate
Olfactory tract
Medial internal nasal branch of anterior ethmoidal nerve (CN V1)
Olfactory nerves (CN I)
Nasopalatine nerve (CN V2)
Incisive canal
Nasal septum
F. Netter M.D.

Plate 47 Arteries of Nasal Cavity: Bony Nasal Septum Turned Up

See also **Plates 57** (s0290) , **63** (s0320)

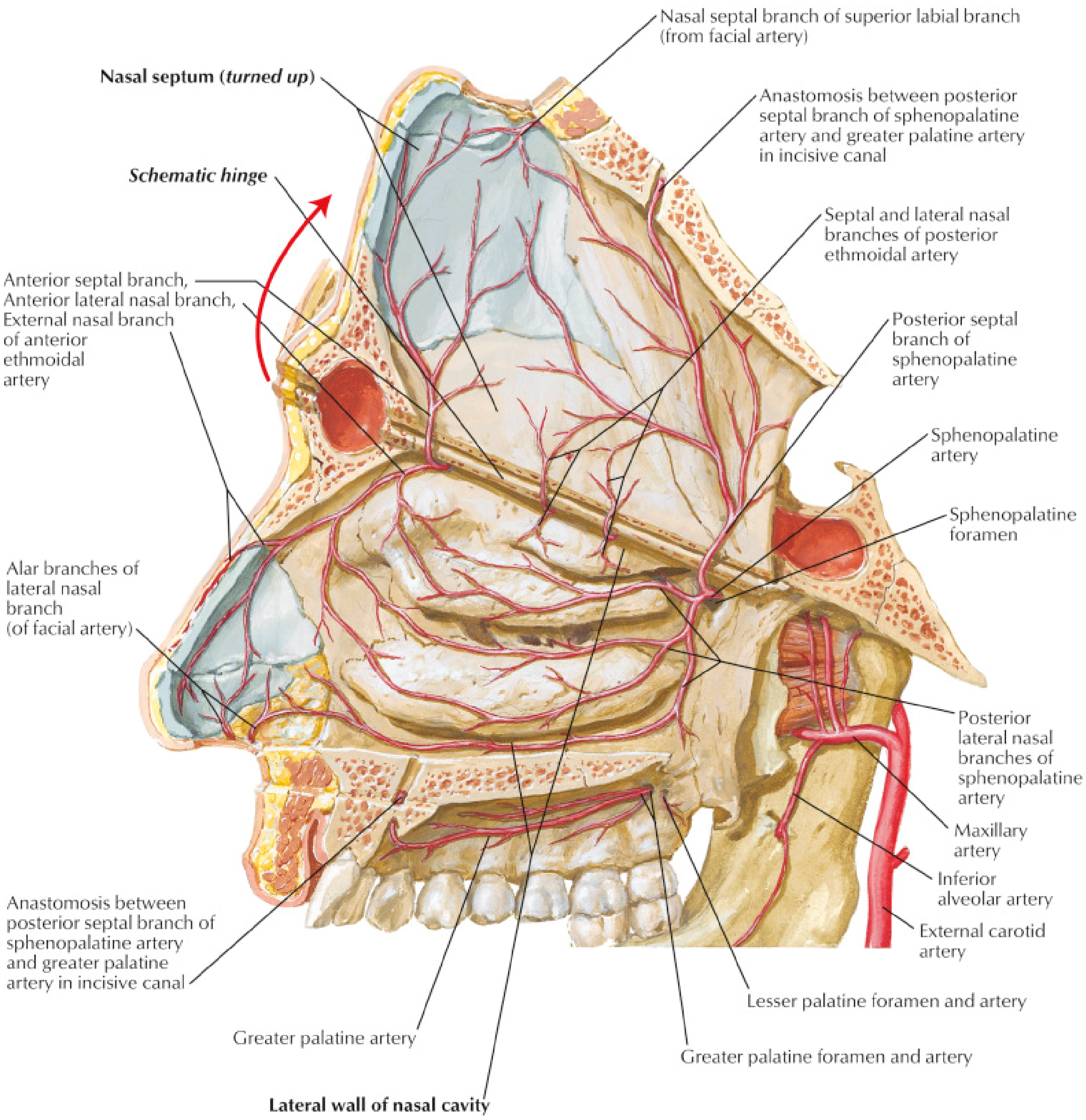
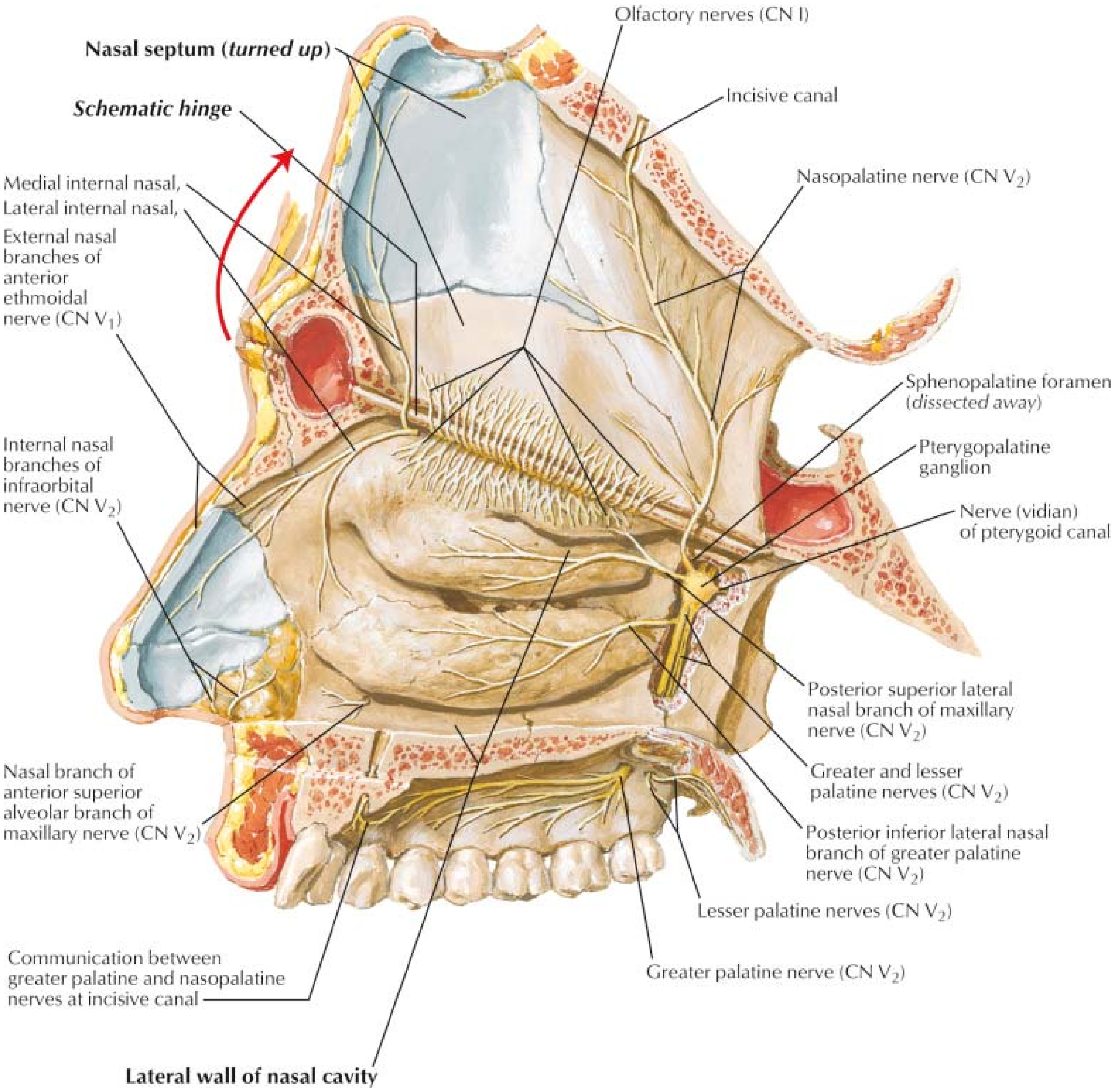

Nasal septal branch of superior labial branch (from facial artery)
Nasal septum (turned up)
Anastomosis between posterior septal branch of sphenopalatine artery and greater palatine artery in incisive canal
Schematic hinge
Septal and lateral nasal branches of posterior ethmoidal artery
Anterior septal branch, Anterior lateral nasal branch, External nasal branch of anterior ethmoidal artery
Posterior septal branch of sphenopalatine artery
Sphenopalatine artery
Sphenopalatine foramen
Alar branches of lateral nasal branch (of facial artery)
Posterior lateral nasal branches of sphenopalatine artery
Maxillary artery
Inferior alveolar artery
External carotid artery
Anastomosis between posterior septal branch of sphenopalatine artery and greater palatine artery in incisive canal
Lesser palatine foramen and artery
Greater palatine artery
Greater palatine foramen and artery
Lateral wall of nasal cavity
F. Netter M.D.

Plate 48 Nerves of Nasal Cavity: Bony Nasal Septum Turned Up

See also **Plate 62** (s0315)


Olfactory nerves (CN I)
Nasal septum (*turned up*)
Schematic hinge
Incisive canal
Nasopalatine nerve (CN V$_2$)
Medial internal nasal,
Lateral internal nasal,
External nasal branches of anterior ethmoidal nerve (CN V$_1$)
Sphenopalatine foramen (*dissected away*)
Pterygopalatine ganglion
Internal nasal branches of infraorbital nerve (CN V$_2$)
Nerve (vidian) of pterygoid canal
Posterior superior lateral nasal branch of maxillary nerve (CN V$_2$)
Greater and lesser palatine nerves (CN V$_2$)
Nasal branch of anterior superior alveolar branch of maxillary nerve (CN V$_2$)
Posterior inferior lateral nasal branch of greater palatine nerve (CN V$_2$)
Lesser palatine nerves (CN V$_2$)
Communication between greater palatine and nasopalatine nerves at incisive canal
Greater palatine nerve (CN V$_2$)
Lateral wall of nasal cavity

F. Netter M.D.

Plate 49 Nose and Maxillary Sinus: Transverse Section

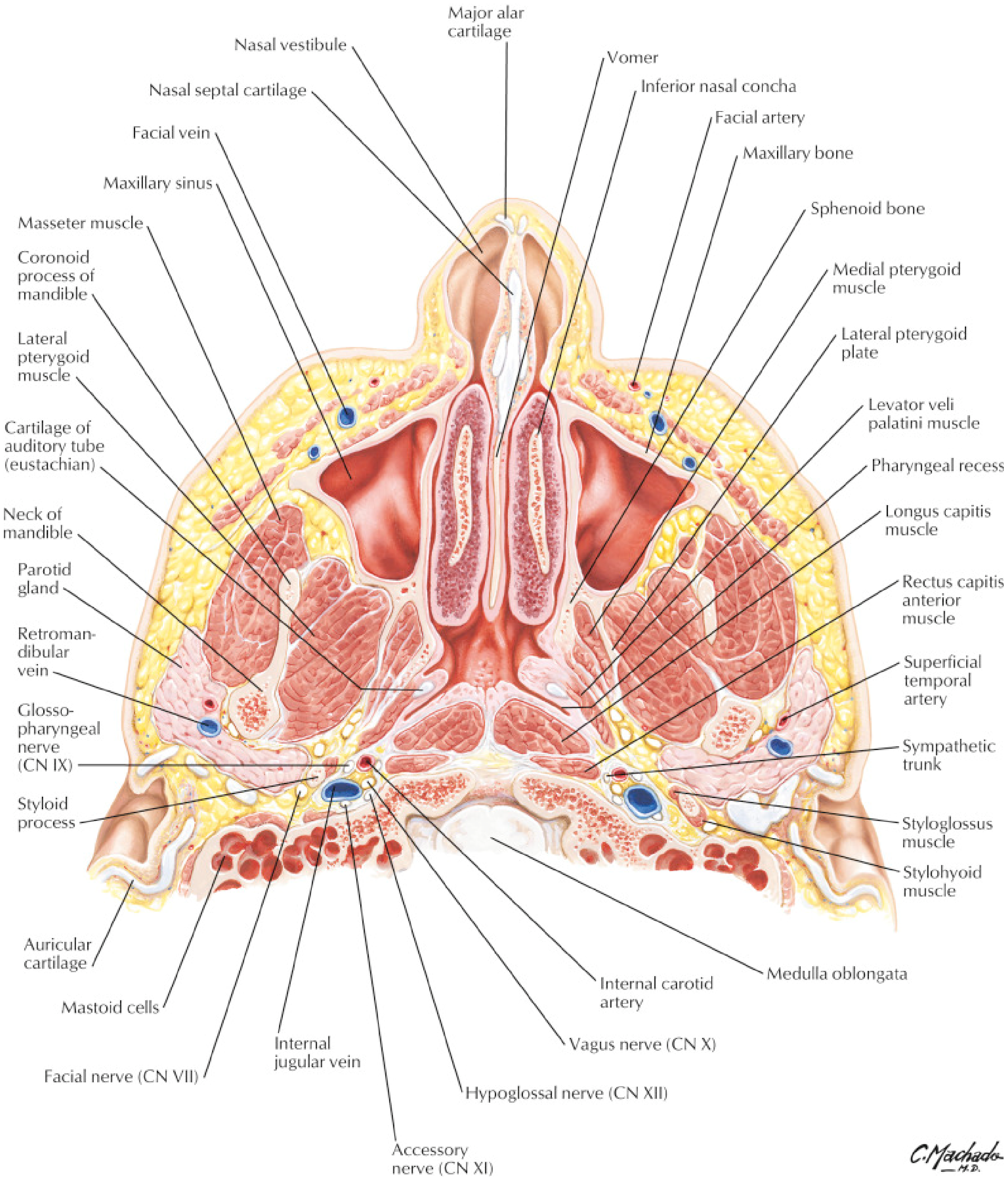

Major alar cartilage
Nasal vestibule
Vomer
Nasal septal cartilage
Inferior nasal concha
Facial vein
Facial artery
Maxillary bone
Maxillary sinus
Sphenoid bone
Masseter muscle
Coronoid process of mandible
Medial pterygoid muscle
Lateral pterygoid plate
Lateral pterygoid muscle
Levator veli palatini muscle
Cartilage of auditory tube (eustachian)
Pharyngeal recess
Neck of mandible
Longus capitis muscle
Parotid gland
Rectus capitis anterior muscle
Retromandibular vein
Superficial temporal artery
Glossopharyngeal nerve (CN IX)
Sympathetic trunk
Styloid process
Styloglossus muscle
Stylohyoid muscle
Auricular cartilage
Medulla oblongata
Internal carotid artery
Mastoid cells
Vagus nerve (CN X)
Internal jugular vein
Facial nerve (CN VII)
Hypoglossal nerve (CN XII)
Accessory nerve (CN XI)
C.Machado M.D.

Plate 50 Paranasal Sinuses: Coronal and Transverse Sections

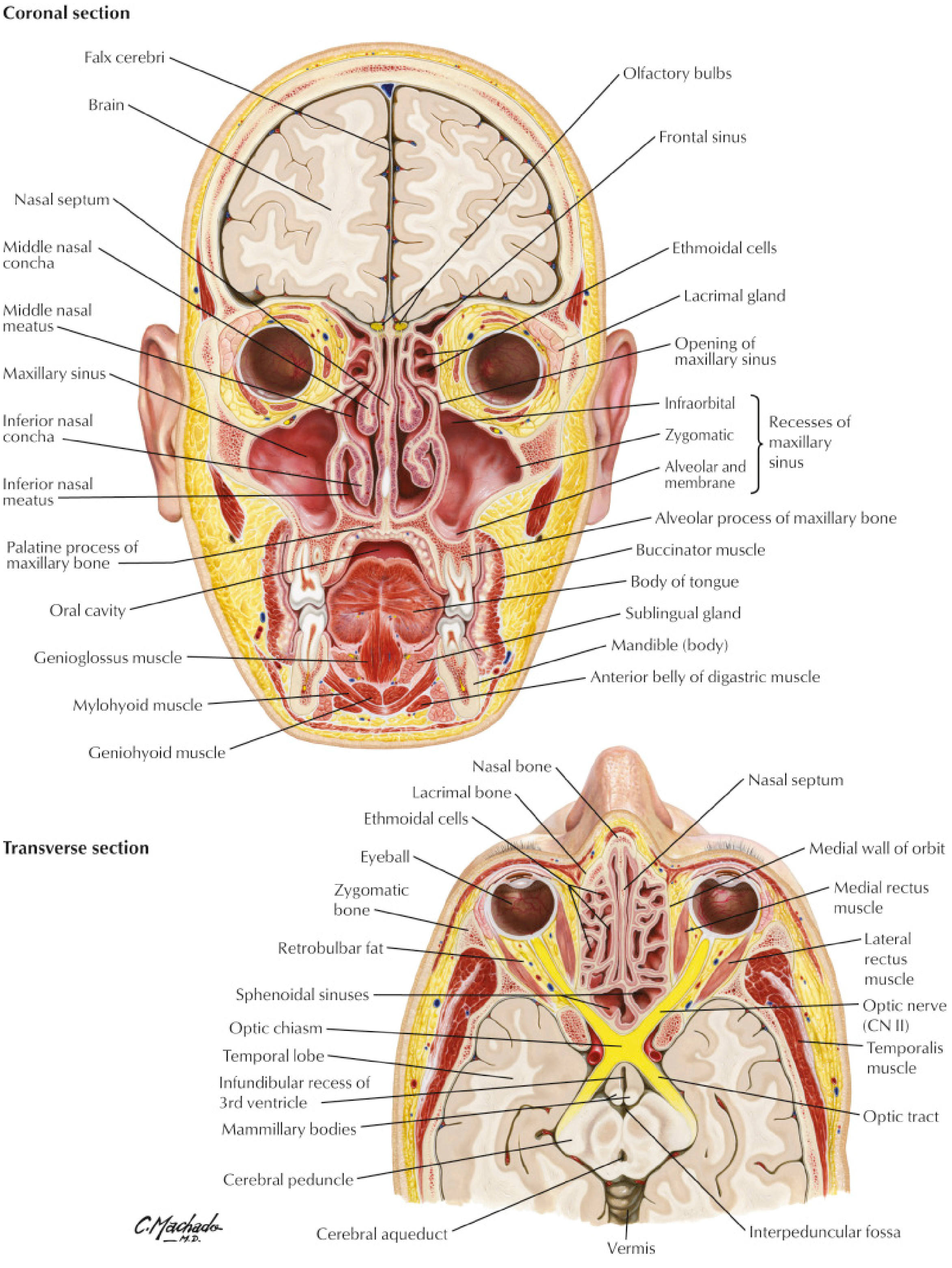

Coronal section
Falx cerebri
Brain
Nasal septum
Middle nasal concha
Middle nasal meatus
Maxillary sinus
Inferior nasal concha
Inferior nasal meatus
Palatine process of maxillary bone
Oral cavity
Genioglossus muscle
Mylohyoid muscle
Geniohyoid muscle
Olfactory bulbs
Frontal sinus
Ethmoidal cells
Lacrimal gland
Opening of maxillary sinus
Infraorbital
Zygomatic
Alveolar and membrane
Recesses of maxillary sinus
Alveolar process of maxillary bone
Buccinator muscle
Body of tongue
Sublingual gland
Mandible (body)
Anterior belly of digastric muscle
Transverse section
Nasal bone
Lacrimal bone
Ethmoidal cells
Eyeball
Zygomatic bone
Retrobulbar fat
Sphenoidal sinuses
Optic chiasm
Temporal lobe
Infundibular recess of 3rd ventricle
Mammillary bodies
Cerebral peduncle
Cerebral aqueduct
Vermis
Nasal septum
Medial wall of orbit
Medial rectus muscle
Lateral rectus muscle
Optic nerve (CN II)
Temporalis muscle
Optic tract
Interpeduncular fossa
C. Machado M.D.

Plate 51 Paranasal Sinuses: Parasagittal Views

See also **Plate 43** (s0220)

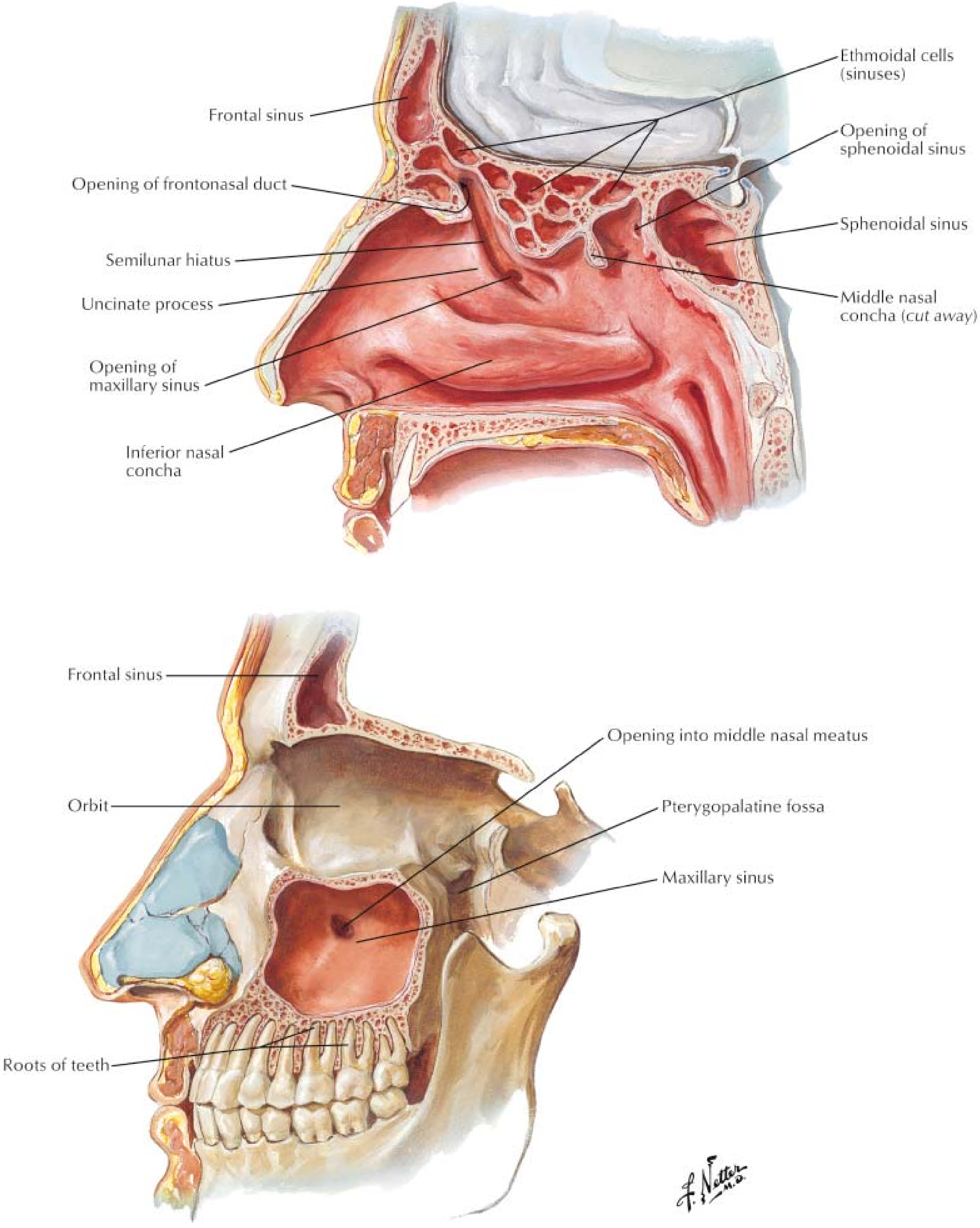
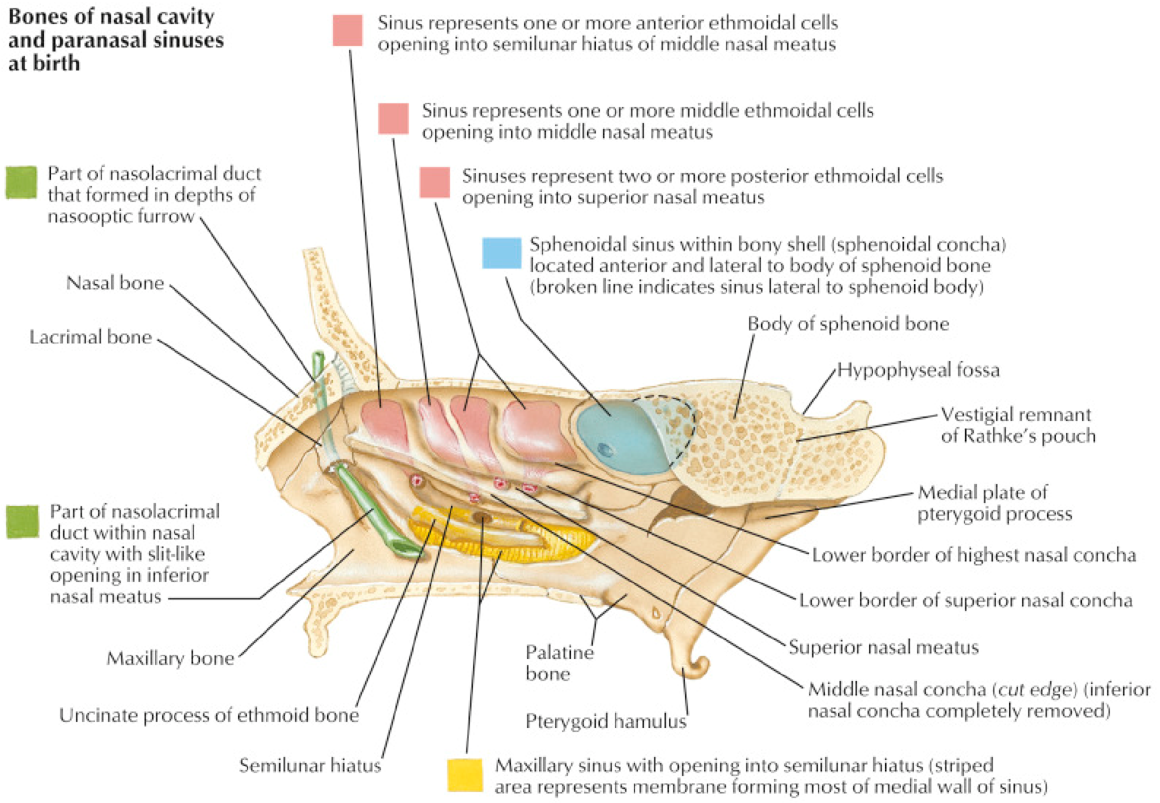

Frontal sinus
Opening of frontonasal duct
Semilunar hiatus
Uncinate process
Opening of maxillary sinus
Inferior nasal concha
Ethmoidal cells (sinuses)
Opening of sphenoidal sinus
Sphenoidal sinus
Middle nasal concha (*cut away*)
Frontal sinus
Orbit
Roots of teeth
Opening into middle nasal meatus
Pterygopalatine fossa
Maxillary sinus

Plate 52 Paranasal Sinuses: Changes with Age


Bones of nasal cavity and paranasal sinuses at birth
Sinus represents one or more anterior ethmoidal cells opening into semilunar hiatus of middle nasal meatus
Sinus represents one or more middle ethmoidal cells opening into middle nasal meatus
Sinuses represent two or more posterior ethmoidal cells opening into superior nasal meatus
Part of nasolacrimal duct that formed in depths of nasooptic furrow
Sphenoidal sinus within bony shell (sphenoidal concha) located anterior and lateral to body of sphenoid bone (broken line indicates sinus lateral to sphenoid body)
Nasal bone
Body of sphenoid bone
Lacrimal bone
Hypophyseal fossa
Vestigial remnant of Rathke's pouch
Medial plate of pterygoid process
Part of nasolacrimal duct within nasal cavity with slit-like opening in inferior nasal meatus
Lower border of highest nasal concha
Lower border of superior nasal concha
Maxillary bone
Palatine bone
Superior nasal meatus
Middle nasal concha (cut edge) (inferior nasal concha completely removed)
Uncinate process of ethmoid bone
Pterygoid hamulus
Semilunar hiatus
Maxillary sinus with opening into semilunar hiatus (striped area represents membrane forming most of medial wall of sinus)

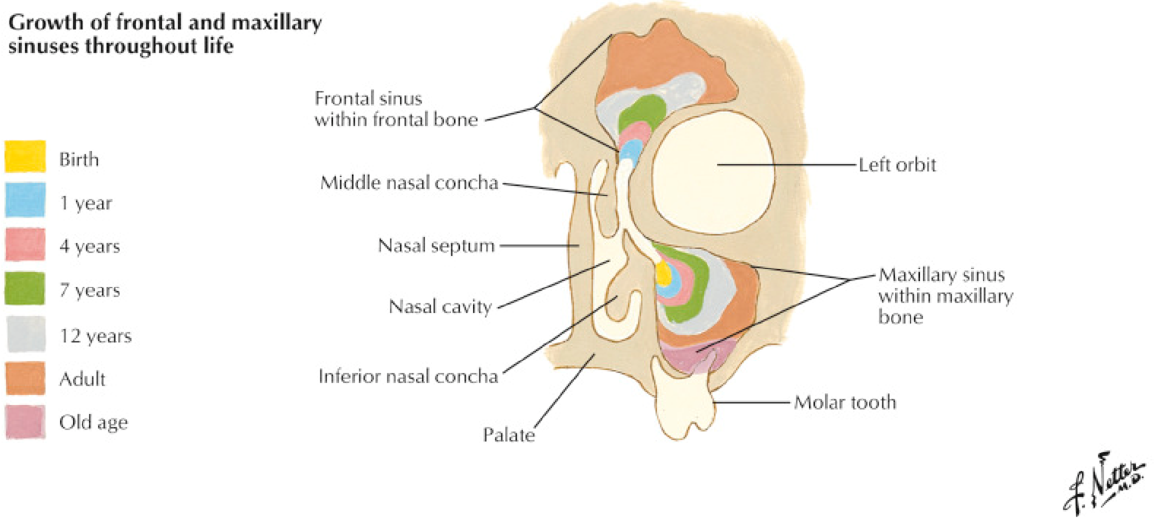

Growth of frontal and maxillary sinuses throughout life
Birth
1 year
4 years
7 years
12 years
Adult
Old age
Frontal sinus within frontal bone
Middle nasal concha
Nasal septum
Nasal cavity
Inferior nasal concha
Palate
Left orbit
Maxillary sinus within maxillary bone
Molar tooth

Plate 53 Salivary Glands

See also **Plates 54** (s0275) , **144** (s0760) , **145** (s0765)